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Culture and Character Through Language and Literature

Kenneth D. Longsdorf

Let us agree at once that we believe the aims in teaching English in a school for the blind to be essentially the same as those in a school for the seeing. To attempt to find a clash in purpose would seem to invite tragic results. Such a point of view either would deny the blind much that is rich in literature, or it would make sightless pupils feel like "special cases" in a realm where specialized aims are reduced to a minimum.

Of course there are differences in method, approach, and actual classroom procedure, but it is in the *aims* that teachers of the blind and teachers of the seeing must agree.

General Objectives in Secondary School English

The aims in general upon which teachers of the blind must agree are as follows:[1]

1. Cultivating among the members of the class an active taste for reading of a higher level than that to which they have previously been accustomed.
2. Enriching the minds of boys and girls by presenting to them through literary selections a conception of the intensity and variety of human experience and human emotions.
3. Cultivating an ability in the individual student to interpret literature, whether it be prose or poetry; to interpret it accurately, intelligently, and, with varying degrees of intensity, emotionally.
4. Teaching the pupils to write correctly and with originality.
5. Introducing the pupils to vocational English by presenting radio plays, choral speech programs, and classroom dramas.

In school grading, blind pupils are frequently retarded from one to three years. To meet the needs of these students, units prepared for slow-learning or retarded groups should be considered and adapted. Excellent units for this purpose are available, notably those produced by the Philadelphia and the Rochester (New York) public schools.

Objectives for Classes of Ungraded Pupils

The following objectives are adapted from a course suggested by the Board of Education of Rochester, New York:

1. The pupil should have acquaintance with social customs, know how to make introductions, how to meet people with confidence, and how to conduct himself properly in public places.
2. He should be a reasonably proficient reader, with some ability to discriminate among the books and periodicals that he reads regularly.
3. He should know the technique of using the telephone efficiently.
4. He should be able to write correctly business letters of the order or complaint type, and to express himself clearly in simple, straightforward English when giving written instructions or announcements.
5. He should know how to make intelligent use of the radio, and to some extent of the photoplay, to get the maximum amount of pleasure from them.
6. He should speak the English language with reasonable regard for correct usage.
7. He should know how to use the tools of a library.
8. He should be able to extend his interests and to broaden his experiences by read-

[1] Adapted from *A Non-Regents' Course of Study in English: Grades 7-12,* pages 2-3. Board of Education, Rochester, New York; 1936. Used by permission.

ing both for enjoyment and for information.

9. He should read literature that offers something of more value than mere entertainment or information. It should have cultural value as well.

The units suggested for this course were as follows:[2]

Unit I.	Social Adaptation
Unit II.	Oral Expression
Unit III.	Communication
Unit IV.	Parliamentary Procedure
Unit V.	Magazines and Newspapers (depending on amount of vision. Adapt to braille *Reader's Digest* and *Time,* especially.)
Unit VI.	Radio Appreciation
Unit VII.	Photoplay Appreciation
Unit VIII.	Sentence Building and Correct Usage
Unit IX.	Punctuation and Capitalization
Unit X.	Vocabulary Building and Spelling

Motivation of reading and literature may be stimulated by such units of interest as the following: animals, the home, sports, aviation, travel and adventure, detective and mystery, romance, biography, the romance of industry, and character.

Methods of Procedure in English Classes[3]

One of the first things a seeing teacher in a school for the blind will miss is the blackboard. Inability to use this familiar teaching tool will cause considerable readjustment of method. There must be greater dependence on oral teaching and the dictation of summarized and outlined material. The braille typewriters and slates are of great value and should be in constant use. It has been found that planning to use the braille writer on regular days is a method that is most successful in pragmatic results. On appointed days the teacher dictates outlines and brief lists of facts to be memorized. Review questions in braille are answered by the pupils and corrected in class by the teacher, with the coöperation of the students.

The ordinary typewriter is also invaluable. Most of the written work in the secondary school department must be done in inkprint, for this material forms a vital part in the preparation of the pupils for a modern and busy world. In schools where college entrance examinations are given, the more practice the pupils get in typewriting, the better.

Correction of compositions typewritten by blind pupils is one of the teacher's most annoying problems. If the pupils have no vision, the teacher cannot return to them papers corrected with the customary red or blue pencil. For the most part, the instructor must rely on the rather tedious method of "reading back" the compositions to the pupils and pointing out their errors. He may read them to the class as a whole, or he may call individual pupils to his desk, and while he is going over their papers with them assign the rest of the class special work, possibly in connection with the next day's assignment. Typical and serious errors ought to be reported to the whole class. If the group is a large one, it is best not to attempt to read back every pupil's composition each time one is assigned.

It is important that the classes in high school English be adequately supplied with braille textbooks, which are indispensable for study outside of class. Without good text material there is grave danger of lost motion. Where braille books are lacking, they should be privately embossed.

Building a vocabulary and the accompanying study of spelling play a large part in teaching literary appreciation. Teaching spelling is a well-known problem in the education of the blind. In the lower grades of the secondary school it is advisable to continue the methods of study followed in the elementary grades, modifying procedures to suit the greater maturity of the pupils. To these

[2] *Ibid.*

[3] For a more detailed exposition by the author of this article, Kenneth D. Longsdorf, see his monograph, *Aims In Teaching English Literature*. Monograph No. 2, New York Institute for the Education of the Blind; 1936.

grades also belong the introduction of spelling rules (kept very simple), and the study of prefixes, suffixes, and stems may be continued as the need for them presents itself. For example, the rules for "cede" may prove helpful at this time.

Even in high school grades, vocabulary-building and spelling need to be stressed. A daily review, breezily conducted for ten minutes, meets with splendid results. Words are spelled orally by each pupil in turn. Words difficult in spelling and meaning are copied in braille by the pupil and kept in a notebook. This brief review each day serves to unify the thinking and centralizes attention early in the class period.

Inasmuch as even the more able blind pupils cannot hope to read as many books as the better-than-average seeing students, oral book reports in class may be of great service in widening literary horizons. Pupils show keen interest in discussing such books as *The Return of the Native, The Call of the Wild, Main Street, Pride and Prejudice, Green Mansions, The Scarlet Letter, Oliver Twist, Two Years Before the Mast, Arrowsmith, Lord Jim, The Virginian,* and *The Mill on the Floss.*

The Talking Book[4] may be used in a supplementary way to great advantage. It is a novel form of teaching literature and arouses the interest of the pupils, often to a high pitch. Especially is the recorded word valuable in teaching poetry. A number of the recordings of verse are excellent. The better pupils may be organized as an "Honors" group and allowed to hear recordings outside of class.

The radio, too, may play an important part in education today. As the standards of broadcasting have improved from year to year, the radio has become an increasingly valuable medium of instruction, both in and out of school hours. Our pupils need to be encouraged to select the better programs. A broadcast like that of "America's Town Meeting of the Air" can go a long way toward supplying information that sightless readers are unable to gain from newspapers.

The biographical method of teaching is having a resurgence of deserved popularity. The use of this method is illustrated by the following unit devoted to the study of the biographies of successful blind persons.

ACHIEVEMENTS OF SUCCESSFUL BLIND PEOPLE

A Unit for Grades 9 to 12

Primary objective: To make our lives richer by recapitulating some of the experiences of visually handicapped people who before us have faced some of our problems.

Enabling objectives: To experience vicariously the early struggles of blind persons; to compare their difficulties with those we are meeting today; to share their joys and sorrows, victories and defeats, in order that we may be the better prepared to lead useful lives.

Procedure: To read the following books *out* of class and report upon them *in* class at regular intervals.

A READING LIST FOR BOOK REPORTS

Adams, Almeda C. *Seeing Europe Through Sightless Eyes.* (Author blind)

Artman, William, and Hall, L. V. *Beauties and Achievements of the Blind.*

Bowen, B. B. *Blind Man's Offering.* (Author blind)

Braddy, Nella. *Anne Sullivan Macy: The Story Behind Helen Keller.*

Bretz, Alice. *I Begin Again.* (Author blind)

Brown, Eleanor Gertrude. *Milton's Blindness.* (Author blind)

Campbell, Mary R. *The Life of Walter L. Campbell.*

Crosby, Fanny J. (Mrs. Alexander Van Alstyne). *Memories of Eighty Years.* (Author blind)

Deeping, Warwick. *Blind Man's Year.* (Fiction)

French, Richard Slayton. *From Homer to Helen Keller: A Social and Educational Study of the Blind.*

Hawkes, Clarence. *The Light That Did Not Fail.* (Author blind)

Hollins, Alfred. *A Blind Musician Looks Back: An Autobiography.*

Holt, Winifred. *The Light Which Cannot Fail: True Studies of Heroic Blind Men and Women.*

[4] See *Learning by Listening.* An annotated, classified and graded list of Talking Book records for use in schools for the blind. Prepared by Berthold Lowenfeld. American Printing House for the Blind; 1939.

Howe, Maud, and Hall, Florence Howe. *Laura Bridgman: Dr. Howe's Famous Pupil and What He Taught Her.*

Jackson, S. Trevena. *Fanny Crosby's Story of Ninety-four Years.*

Javal, Emile. *On Becoming Blind: Advice for the Use of Persons Losing Their Sight.*

Keller, Helen. *The World I Live In.* (Author blind)

—— *The Story of My Life.*

—— *Midstream: My Later Life.*

—— *Helen Keller's Journal, 1936-1937.*

Kipling, Rudyard. *The Light That Failed.* (Fiction—by way of contrast)

Latimer, Henry Randolph. *The Conquest of Blindness: An Autobiography.* (Author blind)

Mannix, John Bernard. *Heroes of the Darkness.*

McNeil, Mary. *The Blind Knight of Nova Scotia: Sir Frederick Fraser.*

Montague, Margaret Prescott. *Closed Doors: Studies of Deaf and Blind Children.*

Pearson, Sir Arthur. *Victory over Blindness.* (Author blind)

Rawlinson, Private James H. *Through St. Dunstan's to Light.* (Author blind)

Richards, Laura E. *Laura Bridgman: The Story of an Opened Door.*

Wilber, Louise. *Vocations for the Visually Handicapped.*

Wilson, James. *Biography of the Blind: The Lives of Such as Have Distinguished Themselves as Poets, Philosophers, Artists, etc.* (Author blind from infancy)

Woodbridge, Timothy. *The Autobiography of a Blind Minister.*

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Rosenblatt, Louise M. *Literature as Exploration.* D. Appleton-Century Company, Inc., New York; 1938.

Smith, Reed. *The Teaching of Literature in the High School.* American Book Company, New York; 1935.

Weeks, Ruth Mary. *A Correlated Curriculum.* D. Appleton-Century Company, Inc., New York; 1936.

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American Association of Instructors of the Blind, Proceedings. "English in the Junior High School." (1938.) Page 177.

Cutsforth, Thomas D. "The Unreality of Words to the Blind." *The Teachers Forum* (May, 1932), pages 86-89.

Elliott, Ruth. "Spoken English at the Oklahoma School for the Blind." *The Teachers Forum* (September, 1938), page 8.

Farris, L. P. *Visual Defects as Factors Influencing Achievement in Reading.* A thesis submitted in partial satisfaction of the requirements for the degree of Doctor of Education in the University of California; May, 1936.

Lee, M. M. "Station KOSB." *The Teachers Forum* (September, 1936), page 12.

Lippa, Josephine. "Introducing the Blind to Reading." *The Teachers Forum* (May, 1932), pages 82-83.

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——"The Talking Book in English Classes." *The Teachers Forum* (May, 1936), page 97.

McAtee, Irma Vanderveer. "Adequate Course of Study in English for the Fourth, Fifth, Sixth, and Seventh Grades." *American Association of Instructors of the Blind, Proceedings* (1938), pages 62-71.

Moore, Eoline Wallace. "What Poems Do Blind Children Like?" *The Teachers Forum* (March, 1933), pages 68-72.

Outlook for the Blind. "Debating." Vol. 2, pages 58, 87; Vol. 8, page 170.

Smead, George L. "The Literary Education of the Blind." *American Association of Instructors of the Blind, Proceedings* (1878).

Smith, Dora V. *Instruction in English.* Bulletin No. 17, Monograph No. 20, Federal Security Agency, Office of Education, Washington, D. C.; 1932.

The Teachers Forum. "Blind Pupils Can Enjoy Shakespeare." Vol. 2, No. 3, page 7.

—— "Interschool Spelling Contest." (November, 1929), pages 11-13.

—— "Tested Projects in High School English." Vol. 6, No. 3, page 51.

Wilson, George S. "The Blind in Literature." *American Association of Instructors of the Blind, Proceedings* (1909), pages 7-17.

Projects for the Blind in the Social Studies

George L. Howeiler

Educators are in almost complete agreement concerning the merits of the project method of teaching. Disagreement has arisen mainly over definition. There are those who maintain that anything accomplished under pupil motivation is a project, such as the dramatization of a current event, production of a pageant, reading a book, construction of models, writing themes, collecting pictures, drawing maps and charts, dressing dolls, keeping notebooks, solving problems, cultivating a plot of ground. These are the extremists. In general, however, the definition that a project is a "pupil-planned, purposeful task accomplished in a real situation" holds wide acceptance and the word will be used in this sense throughout the following pages. It may be a group as well as an individual activity. It may be participated in by the dull as well as the bright, by the physically handicapped as well as the normal pupil. To further clarify this particular method of teaching, some specific examples drawn from the social studies will be given.

In a course dealing with problems of democracy, an excellent project consists of having the class organize itself into a governmental body, patterened as closely as possible after our own local, state or federal government. Debates on current problems can then be carried on under parliamentary rules, the teacher acting only in a supervisory capacity. Thus the pupil is aided in his development as a citizen by the use of more concrete and meaningful instruction.

While history does not lend itself so well to the project method of teaching as do other branches of the social studies, still it has certain worth-while possibilities. The writer recalls one project, for instance, in which the pupils gathered historical data on their own local community, data which consisted of historical facts and pictures together with political, social and economic trends. Pupils in botany, biology, general science and other subjects cooperated. The material was compiled and edited, as a result of which the pupils not only gained a better understanding of their own community but the community itself took a greater interest in the school.

Similarly, a class in American history entered upon a peace campaign, which culminated in an Armistice Day program, at which time the community received bulletins containing a brief history of America's participation in the World War, the deplorable results of that war, and essays on the desirability and importance of peace. Here, too, the school involved gained notable prestige and the community was made richer by the experience.

At the New York Institute for the Education of the Blind a project was recently carried out which demonstrates to a certain extent the applicability of the project method to handicapped pupils. Economic geography was the course concerned. The thirteen members of the class consisted of three girls and ten boys representing each of the four high school grades. While their teacher had had previous experience with this particular method of instruction, it was his first application of it to a situation in which all his pupils either had low visual acuity or were totally blind. Therefore, it may be helpful to other teachers new in the field of the education of the handicapped to set forth in greater detail the development of this project. The technique used in its initiation may be of special interest, for it furnishes us with an example of how a teacher, Mr. X in this case, could motivate his pupils into desired activity along democratic lines, as the following paragraphs will show.

School had been in operation approximately one month. The economic geography class met four days out of each week for a period of forty-five minutes each day. A portion of

each period was given over to either lecture, textbook recitation, class discussion, or any combination of the three, leaving the remaining fifteen or twenty minutes for supervised study on the next assignment. It was during the fourth week of school near the close of the class period, at which time a unit of study had been completed and it was undesirable to introduce a new one, that Mr. X launched forth upon his experiment.

"During the remainder of this period," he stated, "I can do either of two things: I can read an interesting article to you, or, if you so desire, I can offer a few suggestions concerning a project we might work on at regular intervals for the next few weeks. Which do you prefer to have me do?" One member asked for the suggestions; whereupon a vote was taken, the result of which revealed unanimous approval of that member's request.

Briefly, the suggestions then offered were something like this: Each pupil would select a topic, preferably one of personal interest to himself. Since the course concerned economic geography, it would be altogether reasonable, therefore, to choose some product, industry, or even economic problem related thereto. It might be rayon silk, for example. Again, it might be commercial fishing. Or even the tariff problem might be chosen. Indeed, the pupil's choice could be a combination of these or even entirely different from them.

A selection having been made, the pupil then would draw up a tentative plan for his project, including such matters as potential content, probable sources of information and a general outline of procedure. This he would submit to his teacher for criticism and direction. The typewriting room, it was explained, could be used one period each week. Here braille writers and slates would also be available. Since four members of the class had an ophthalmologist's permission to read ordinary print to a limited extent, the class would be divided into four groups, the chairman of each group acting as an assistant to the other members in all matters requiring vision at times when the services of the teacher were not available. It would be a laboratory, a social science laboratory, in which each pupil would have the opportunity to produce something original.

"What do you think of such an idea?" Mr. X asked.

There were several enthusiastic expressions of approval.

"Does anyone object?" he continued, whereupon one pupil offered the opinion that the idea was impractical and would lead only to confusion.

"All right, what do the rest of you think about this?"

No one responded. They either had nothing to say or else were unwilling to say it. Mr. X continued.

"True, the idea might be impractical for us. But can we decide that before we try it?"

A discussion thereupon arose, centered about the arguments that most innovations, no matter of what kind, are at first regarded as impractical, that success depends in large part upon the will to succeed, and that it would be the pupils, not the idea, that would be at fault should the experiment fail. Moreover, should there be too much confusion, it would be quite easy to discontinue the project and revert to the traditional classroom activity.

"But I don't see much value in it," insisted the pupil.

This was a point that Mr. X was probably waiting for. "I'm glad you brought that up," he said. "Too often we do things in this world without giving a thought to their values."

There followed a few minutes of discussion. In it was brought out the fact that the members of this class had had virtually no experience in research of this kind, and that such a new experience in itself would be of value. Furthermore, such matters as letter writing, use of the inkprint library, group activity, and organization of material, to say nothing of the information obtained, are certainly worth-while activities. And, when the value of the project was placed in juxtaposition to that of the regular classroom ex-

ercise, there was no further question concerning its desirability. The entire class was anxious to commence the new experiment.

Accordingly, the pupils met in the typewriting room the following Thursday, four groups were organized, the leader of each being assigned a seat between the other members, three groups having three members, and the fourth having four. Suggestions for individual projects were then read by the teacher, and the remainder of the period was given over to the selection of the individual projects.

The plan in operation functioned something like this: By keeping a record of every pupil's activity, Mr. X was able to keep everyone busy. While one pupil might be writing a letter to, let us say, the Bureau of Mines at Washington, D. C., another would be drawing up an outline of his work or else seeking material in the library under the librarian's supervision. The following Thursday the one pupil might turn to his outline, or the library, or to his chairman for assistance, while the other wrote his letter asking for information. It was planned to have each pupil write at least one letter, draw up one outline in braille and duplicate it in typewriting, spend one or two periods in the library, and use the Talking Book machine whenever possible. Mr. X was available to all, acting somewhat in the capacity of coordinator and special assistant whenever needed.

All projects were completed in the course of fourteen weeks. Some consisted of only written material in essay style. Others, however, included pictorial matter, supplements, and bibliographies, while one or two contained objective material to be used for supplementary purposes. In content they ranged from the moving picture industry, through leather, cotton, canning, television, ice cream, railroads, express, telephone, rayon, tobacco, down to copper and coal. When all had finished, oral reports were given by each individual member before the whole group.

No great obstacles presented themselves during the course of the experiment. The chief difficulty lay in making suitable arrangements for reading rooms to which a pupil and his assistant might adjourn. This was met through use of the homeroom and library. Occasionally, two groups stayed in the same room under supervision, but frequently they were permitted to go to separate rooms. Sometimes all remained in the laboratory, especially when only one or two pupils required oral reading service.

On the whole the project experiment proved successful. Several pupils became diffident after the first few periods of work. Others remained enthusiastic right up to the final report. Only one expressed dissatisfaction with the tediousness of the activity. And Mr. X is certain that all of them gained much from the valuable experience of writing business letters and addressing envelopes, an activity in which some of them were obviously deficient. Had there been no other value connected with the experiment, certainly this alone would have compensated in large measure for the time and effort spent. But in the opinion of the present writer, the greatest value of all lay in the fact that these pupils had accomplished something concrete, something of their own. They had done something which normal pupils in social studies classes in the regular schools have done, and to the visually handicapped child such an achievement is of inestimable value.

The research type of project, entailing a great deal of reading, is the most difficult. Its successful operation at the New York Institute for the Education of the Blind should indeed be an encouragement to educators in that field. Given a suitable laboratory, these handicapped children need not continue to be denied the advantages of project-method teaching, so common in modern methodology. They should be placed upon their own responsibilities as much as possible, where they are confronted with as many problems as may be desirable, and the project method combined with the laboratory is perhaps the best by which pupil-planned, purposeful tasks can be accomplished in real situations.

(*Continued on page 14*)

Pupil Progress Through Extracurricular Activity

Margaret M. Painton

With a view to providing for each pupil some extracurricular activity which will form a liaison between school and social life, the New York State School for the Blind, at Batavia, has organized and developed, within the past two years, a number of student clubs covering a wide range of interest from academic subjects to athletics. These clubs have been functioning with considerable success, and have gained membership from the major portion of the student body, despite the fact that participation is left entirely to the choice of the individual. The clubs were organized under the supervision of Mr. Eber L. Palmer, superintendent, and with the cooperation of faculty members, whose chief interest, as educators, is in preparing the student to develop into a reliable, self-sufficient adult.

For those whose interests lie in the field of literature, there is the English Club. Sponsored by the head of the English department, this club prepares a school paper, "The Aristocrat," which is published twice a year. It contains poetry, articles, short stories, and essays, which are contributed by students from all departments of the school. The club aims to do all it can to promote the talent for creative writing.

For the ardent reader, the Reading Club, which is divided into high school and grammar school groups, convenes weekly to read and discuss current literature that is not available in braille. The members also attend the monthly Book Review session held at the Y.W.C.A., and conducted by one of the prominent women of the city.

The Current Events Club, sponsored by the principal of the school, assembles weekly to listen to discussions of current topics given by some of the well-known radio commentators. This enables the students to supplement the study of history with the up-to-the-minute happenings of the world today.

The Radio Club serves as a stimulus for those who are scientifically-minded, and provides ample opportunity for experimental work in the field of broadcasting. To assist in this work plans are under way to provide the students with a small amateur broadcasting station. At present they have a receiver and a set of oscillators, making it possible for them to receive and send messages by code. One of the students, Robert Dupont, expects to pass an examination before the close of the year, which will grant him a license to operate an amateur broadcasting station.

Each year, either at Christmas or in the spring, the members of the Dramatic Club present a play. The students take great pleasure in presenting these plays to the public, as it gives them a feeling of good-fellowship to be able to share their talents with their community. Not only does work in the field of dramatics enable a student to utilize his dramatic ability, but it develops self-reliance and poise, so important in the life of every individual.

The boys who are interested in poultry raising have organized a Poultry Club which, although still in its infancy, promises to be a great incentive in carrying out projects in this particular field.

One rather unique and interesting feature of the boys' industrial arts department is the Industrial Supper Club, known to members as the "Bachelor Supper Club." Each week the members of this club, together with the club sponsor, prepare and cook a dinner. Quite frequently, guests from the student body or the faculty are invited to attend. A group effort of this kind is an excellent thing, as it gives the boys an opportunity to become

more independent and helpful about the home.

For the girls of the industrial arts department the Home Economics Club provides a great stimulus in creating an interest in the art and science of homemaking. As it is registered with the National Home Economics Organization, the girls take great pride in being members of the club. Each year they present an assembly program, and sometimes a play, by which they demonstrate that to them, home economics is not merely cooking and caring for the immediate needs of the household, but a subject of universal interest and value. For example, last year they presented a play showing the leading part that home economics is assuming in the field of advertising. This was excellently done, with a novel kitchen band composed entirely of kitchen utensils, adding a humorous feature to the program. In addition to their assembly program, the girls try to maintain an interest in home economics in the school throughout the year. This is done by serving a faculty tea each week, by having frequent food sales, and by preparing and serving dinners and luncheons for various occasions.

Most persons like music, though not everyone is sufficiently gifted to warrant individual instruction. Many of the students are musically inclined, and in order to meet their needs a Choral Club, a Girls' Glee Club, and a Mixed Glee Club have been organized. The Choral Club, better known as the Senior Choir, is a definite part of the school curriculum aside from its extracurricular function. It provides the music for assemblies and presents at Christmas time a most impressive Candle Light Service, as well as two yearly concerts, assisted by other branches of the music department. The paramount aim of the club is to make it enjoyable and beneficial to all students, through fostering an appreciation and a comprehensive understanding of music. New instruments have been procured to enlarge the school orchestra which plays at dances and other social functions.

As the Boy and Girl Scout groups, like the Home Economics Club, are national organizations, the students take a special interest in their membership privileges. Both clubs are keenly interested in Scout work, but take active part in all school affairs. For those boys not yet eligible to belong to the Scout organization, a Cub Pack has recently been organized. The purpose of this Pack is to prepare the younger boys to participate in Scout activities when they have attained the proper age to become members.

In order to create good sportsmanship among the students the school also has an Athletic Club, a Swim Club for the boys, and another for the girls. These clubs offer relaxation from strenuous mental activities, and help the students to become healthy individuals and good leaders.

The newest adjunct to extracurricular activities is a roller skating rink, located in Hamilton Hall, the new dormitory for boys. This provides marvelous exercise, fun and activity for both students and faculty members. Here again the students have an opportunity to expend their energy in a positive manner, and to work together, so to speak, at supervised play.

Among the principal activities is the Social Club, an organization of importance to every student in the school. Its object is to assist the boys and girls to become socially adjusted in order to take their place in the normal adult world. The club seeks to help the members achieve these aims through wholesome enjoyable experiences, rather than through the textbook alone. It is conveniently divided into four groups, junior and senior groups for the girls, and two similar groups for the boys, an arrangement which is of value in meeting the needs of the individual. Through the medium of the club the students receive instruction in etiquette, and in games such as bridge or any other social activity which they desire. They arrange skating parties, theatre parties, and also formal dinners designed to familiarize the pupils with various types of menus and serving. Last season a formal nine-

(*Continued on page 20*)

Dr. Allen Says:

The Influence of Elizabeth Roe Dunning

From a talk given at Overbrook, Pa., March 1, 1940.

Inasmuch as this school has been blessed with a long line of devoted teachers, how is it that the alumnae have singled out for special commemoration now, twenty-five years after her death, their principal teacher between 1889 and 1912, "Miss Dunning"? It is doubtless because the word consecration describes her influence. Certainly no one else so fully entered into the life of the girls.

Members of her family write that she came to teach here because of having had a pupil elsewhere struggling to get an education in spite of defective eyesight; also that she influenced a sister to teach here, and a brother to add to his medical studies the specialty of the eye. Evidently she found "in the need of the blind an outlet for her desire to serve her fellowmen." Perhaps her own suffering from chronic nose and throat trouble had its sympathetic influence.

Miss Dunning's post being head of the Girls' School, some eighty at a time looked to her as their dean. Being by nature approachable, as she was, her girls consulted her at need—brought her their troubles as to a personal friend in authority who had an understanding heart. Principal Burritt says that her characteristic trait was this personal interest. Fellow teachers write that her girls found in her a tower of strength to them individually and a champion collectively. A pupil describes her as "the guiding light and the comforting touch in a dark and lonely world."

Miss Dunning having abounding energy usually seemed indefatigable. Often in free time she would play games with the children, or give them a party or take a group out walking, perhaps to a candy store. They said that she told them from time to time of how her own bringing up to share in the daily housework helped father and mother to make their house a real home; and of how our school if filled with the spirit of mutual assistance could be made homelike instead of being just a collection of pupils and teachers.

Thus she was ever sowing the seeds of character. It was her nature to look for good and useful qualities in the pupils and on finding one to tell its possessor of it and otherwise encourage its cultivation. One day she came to the office to report having a pupil who ought to go to college, and on learning that the Managers might make this possible, she so informed the girl and awakened in her a desire to go to Vassar, Miss Dunning's own alma mater. Of course preparation for the entrance examination required special tutoring. Miss Dunning herself gave this evenings for two years; and her student passed the examinations with high credit. Whereupon the Managers voted to meet necessary expenses for the freshman year. Yes, and because the young woman won scholarship aid enough to meet the half cost of subsequent years, they met the other half. Miss Dunning had even taken her to Poughkeepsie, introduced and settled her there, and otherwise left no stone unturned for starting her, a totally blind girl, off right. For her when graduated, she obtained teaching posts. It had already become a habit of hers to follow up after school days every pupil of promise, so helping to make good many who might not have succeeded alone. She was proud of her pupils, believed in them and was ambitious for them. This they sensed from the beginning, and it encouraged them to make the most of their potentialities.

Along with other winning qualities dear Miss Dunning had a saving sense of humor.

She often made fun of her tone deafness, of her lack of feeling for rhythm and of her inability to dance; yet she would try to waltz at parties, enjoying, as she did, her futile efforts, and laughing loudly at her own clumsiness.

And how she appreciated fair dealing from others! A new boys' principal had been told by his predecessor that, because of the scarcity of braille textbooks, he would do well to beat the girls principal to the library after the summer vacation and get his pick of them. Now this new man, a non-resisting Quaker, discovered on first meeting Miss Dunning that coöperation with her would be kinder and possibly more successful than fighting, and he so told her, whereupon they were good collaborating friends ever afterwards. This gentleman is now principal of the institution.

He recalls that among Miss Dunning's many virtues were foresight, frugality, and generosity; that she left the institution by will $1,000, the income from which to be used for the purchase of books for the staff; also $1,000 each to the Industrial Home for Blind Women and to the Chapin Home for the Aged Blind; and that her former pupils, on realizing how she had long sought a way to give to many of them a comfortable and independent homelife while at work in the world, have now gradually got together some $12,000 (largely from Miss Dunning's investments) to be used for such purposes and have named it the Elizabeth Roe Dunning Club Fund. How better could they perpetuate the influence of a life of such sacrificial service?

Keep this heritage a living, vital thing by commemorating Miss Dunning's work from time to time as you alumnae are doing this evening. Thus will you show what characteristics in teachers pupils most appreciate, also which personalities they most delight to honor. There cannot be too many noble Overbrook traditions. Well may you say of Miss Dunning: She had found man's greatest gift to be *not to gain but to give.*

School Lessons Over Radio

BROADCASTING as a method of education of school children, particularly those with seriously defective vision, is advocated by Miss Olive S. Peck, Supervisor of Braille and Sight-Saving Classes in Cleveland, Ohio, in a report on "The Radio in Sight-Saving Classes" published by the National Society for the Prevention of Blindness.

The effectiveness of this method has been demonstrated, according to Miss Peck, by the successful use of radio lessons which are listended to regularly by 65,000 children in the elementary schools of Cleveland. The greatest benefit of this plan, she believes, is the daily "eye rest period" which it affords.

"Education has been carrying on quite a bombardment of the visual sense for many years," Miss Peck comments. "The use of the auditory sense has been rather neglected as a gateway of learning in the regular classes. But educators are now interested in using radio, and the Cleveland Public Schools are among the pioneers in this field.

"Cleveland radio stations donated fifteen minutes of time each day for school lessons as far back as 1925. At first music appreciation lessons were broadcast, and then arithmetic lessons were started in 1929. The results of music and arithmetic lessons were so successful that art, English, science, health, safety, and social studies, were made subjects of experimentation.

"A grant from the General Education Board of the Rockefeller Foundation in 1938 enabled the Cleveland Board of Education to establish its own school radio station, WBOE, the first of its kind in the United States. One hundred and fifty radio sets have been installed in the school system, one for each school. Some of these are hooked up with public address systems so that the children of any selected classrooms may listen.

"It has been found that radio teaching, to be effective, must have teacher and pupil par-

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A Parent-Teachers' Association at the Iowa School

Georgie Lee Abel

It has seemed for some time at the Iowa School for the Blind that there was a definite need for better understanding and coöperation between the parents of the students and the members of the staff. This need was felt most keenly by those in charge of the guidance program at the school. During the summer of 1939 the director of guidance was given the opportunity of visiting the homes of some of the students in the upper classes of the high school. It was evident from these visits that some of the students had not been able to talk over problems in regard to their plans for the future with their parents. This seemed natural when it was realized that these students had lived three-fourths of the year for a number of years away from their parents.

In the fall of 1939 when this observation was mentioned in one of the guidance committee meetings, it was suggested by one of the members that we organize a Parent-Teachers' Association in our school. The committee immediately began enlisting the help of the right people to carry on this project.

The result was that the Board of Education was kind enough to say that if we could get the parents to visit the school and talk over the problems with the teachers, they would allow them to live at the school for a night and a day. The Lions Clubs were helpful in seeing that transportation was provided in a number of cases where the parents were unable to finance the trip. Also, many of the families were able to get together and share their cars.

Out of approximately one hundred and sixty families at the school, there were representatives from ninety-nine. The committee had cause to feel proud of this result, because it had previously been remarked that if they were able to interest twenty families the first year, it would at least be a beginning.

The families of the state were grouped into four territorial divisions, and the first meeting was scheduled during Education Week. The first group arrived on Sunday afternoon, and remained until Monday after school; at that time the second group was received. The parents took their meals in the dining rooms with their children and slept in the same dormitories. During the day they went to school with their children and found time for conferences with the teachers. The evening was given over to the organization of the association. Committee members were selected on each of the four nights to represent the different sections of the state.

Since that meeting in the fall, the members of the guidance committee have taken their turns meeting in the different parts of the state with the various committees for the purpose of furthering the development of the organization. It is felt that committee meetings conducted under the guidance of the school will result in more unity of purpose being maintained in the state organization.

All four groups, the northeastern, the southeastern, the northwestern, and southwestern, have had their local meetings and have planned their objectives for the year. Their aims were to encourage any parents who were interested to learn braille which would be taught by means of a correspondence course given by one of the teachers of the school. They wished next to make a study of the vocations being engaged in by former graduates of the school in the hope that these people might be aided in their work, and also furnish an inspiration to those students still in school. The third project for this year was to arrange at centrally located places in the four parts of the state a spring or early summer meeting at which they would plan for and study summer vacation projects for the children. Some of the parents realize that their children have

not received enough direction for their leisure time activity. These meetings were scheduled for May and June.

The school guidance committee acts as a clearing house for the association and furnishes any service for which the organization may ask. The school paper, which contains a section on the activities of the group, is sent to each parent. The school also distributes the braille correspondence material. This phase of the work, it should be said, has proved to be of more value than had been expected. Recently a braille letter was received from one of the parents and her child was delighted to find enclosed a letter from the workman on the farm who had become so interested in learning braille that he had written a letter to the youngster.

The school has been able to serve more effectively the parents of the retarded children who have entered school within the past two or three years, and who need special help during the summer vacation. Recently a boy who has been out of school for a number of years wanted to do some extra work in the summer, and his mother was willing to pay for a special teacher whom the school would suggest. This presented an excellent opportunity to give a former student who is now attending college some actual experience in teaching.

Just how much the organization may be able to accomplish is still undetermined but the idea appeals to a large number of the members of the association, and when both parents and teachers can so merge their interests in the child who is to leave our school in the future, certainly it should be expected that there can be more unity in the type of guidance which he can receive both from his school and home.

The interest on the part of the parents was shown at one of the recent meetings when the question was asked, "What shall we do in our organization now?" Several of the parents gave the immediate answer that they wished to return to visit the school again in the fall of 1940. They claimed also that their interest would be even greater than before, for the purpose of their second trip would not be to see the school but to observe the development of the child in another year of his growth. The parents were able to formulate their own suggestions for the type of program they desired during the second year, which was gratifying to the committee which had had to take most of the initiative on the previous occasion.

Up to the present time all of the four groups have had two general meetings and one committee meeting. The braille correspondence course and the vacation or leisure time project have been adequately developed and the vocational study has been planned for the next year.

The guidance committee at the school is composed of the superintendent, Mr. Leslie M. Hays; the high school principal, Mr. John L. Ryan; a teacher in the elementary school, Miss Bess Arthaud; and the guidance director of the school, Miss Georgie Lee Abel.

(*Continued from page 8*)

There is little question in our minds but that the visually handicapped pupil can be benefited by this method as much as any other student. His ability to master the research type of project has been demonstrated. The making of charts and graphs is certainly not beyond his abilities. Certainly the two examples of projects mentioned at the beginning of his article are well within his range of accomplishments, as are many others not included here. True, he has to work harder under the circumstances in some cases, but that is only characteristic of his whole existence, and a little practice along that line in school will not be to his disadvantage. Life itself is a series of problems and projects, a fact to which educationists have but recently responded, and the more our schools, ordinary and otherwise, recognize this fact and place our educational system on such a foundation, the greater will be the achievements of those schools.

Our Bookshelf

KATHRYN E. MAXFIELD, PH.D.

FEW will deny that blindness and deafness are the most severe of the physical handicaps to which mankind is subject. Given both sight and hearing the normal man is at home in a world that has been organized in terms of those who see and hear; deprived of either sight or hearing he has no world of the blind or of the deaf to which he can withdraw, for no such world could be independently functional as a minor unit in the larger system.

However, on the part of many who know blind and deaf people well there is a feeling approaching certainty that if the basic psychological needs of these two groups could be discovered and met a larger percentage of both might lead constructive, effective, and satisfying lives, contributing their full share to a seeing, hearing world. Naturally, these remarks presuppose normal mental potentialities and an otherwise normal body. The day is probably still far distant when a child possessed of two or more major handicaps can become a productive member of the average community unless he is blessed with the assets of high intelligence, good personality, and unlimited persistence.

In order to discover the fundamental psychological needs of blind or deaf children, students of the subject have usually approached the problem from one of two angles, that of uncovering differences between the handicapped and the unhandicapped or that of finding similarities. Both approaches are necessary, although it may be that at times too much attention has been paid to the differences.

A volume has recently come to the Bookshelf which presents the results of a group of investigations made during the last twelve years at the Clarke School for the Deaf in Northampton, Massachusetts; which seems to keep in mind the importance of the similarities in mental processes between the deaf and the hearing and at the same time gives due weight to differences which have been found. (Studies in the Psychology of the Deaf. *Psychological Monographs,* Vol. 52, No. 1, 1940). The general supervision of this work has been under Dr. Kurt Koffka, of "Gestalt psychology" fame, but for the last ten years the investigations themselves have been carried out by Dr. Fritz Heider and his wife, Grace Moore Heider.

The first chapter of the book summarizes a series of studies made at the school by Dr. Margarete Eberhardt between 1928 and 1930. She found that "much of the first language development of the young deaf child in school consists in the learning of words for ideas that he already knows and uses in his everyday life." (page 5). "An investigation of the color sorting behavior of deaf children gives added evidence of the priority of concepts over language." (pages 6-22). It is carefully pointed out, however, that the acquisition of vocabulary plays an important part in the creation of new conceptual patterns.

Upon reading these reports one becomes increasingly conscious of the fact that deafness and blindness from an early age do not have contrasting effects on a child's mental organization although they do produce striking differences. For instance, although small deaf children have great difficulty in acquiring speech they nevertheless do acquire concepts of relation, size, space, color, attractiveness and unattractiveness, and of activity in the environment which are grasped only with the greatest difficulty if at all by the totally blind preschool child. The result is that whereas the deaf may lack the vocabulary for important concepts which they understand thoroughly, blind children and even adults often have more vocabulary than they can well use.

It was a realization of the lack of early in-

(*Continued on page 17*)

Concerning the Activity Program

Frances D'Arcy

Most of the discipline problems in the ordinary classroom are due to the child's feeling of insecurity. In many cases this feeling of insecurity has been found to be caused by the lack of some adequate means of self-expression. It may develop a child having a shy negative attitude, or it may produce a child who is actuated by undesirable attention-getting techniques. Since children of the latter sort want the attention of the teacher and the approval of the group, they set out to win both by trying whatever techniques seem most effective at the moment.

The shy child fails in his atttempts to be heard and is often scorned by his group and scolded by his teachers. He immediately becomes less responsive and may even become a little martyr in his own mind. Unfortunately, this child is too easily forgotten. The aggressive child, however, will not be forgotten. He tries one technique after another until he finds one that is successful, for he *will* have attention.

One student indulges in a constant stream of idle chatter during a serious recitation, and learns that he can gain attention by amusing his class and distracting his teacher. Another student finds that he can gain attention by forgetting to do his assignments from day to day. He evokes the concern or condemnation of his teachers and becomes a sort of hero in the eyes of some of his comrades. Another student insists on using poor grammar in the English class, although he knows better. He wins a laugh from his classmates, a glance of displeasure from his teacher, and a following made up of the less judicious of his group. If one technique fails another is substituted until the self-expression seeker becomes more unmanageable, the class more susceptible, and the teacher more irritable.

What is the answer? In each case these students are trying vainly to express themselves. They are asking for attention, striving for some measure of success before their group, and longing for praise and recognition from those in authority. They have plenty of energy, but it is misdirected. They have ability, but are not aware of that ability. They are actually calling for help from those of us who are supposed to guide them.

In the California School for the Blind we have found that one of the surest methods of aiding these students is to fit them into a broad and varied activity program such as would be adopted for seeing children. Our program is planned to include all grades and special departments. It encourages participation in club organizations patterned after the interests of the student population. We aid these self-expression seekers by giving them a key to their own potentialities. This key is simply the realization of their own hidden resources, however limited.

This realization may be brought about in a variety of ways. One student may find himself by working on the school newspaper. Another may play an unusual instrument or perhaps even a humble one, such as a harmonica. Another may find that he can serve on a committee whose duty it is to plan an assembly program, a party, or a field day for the entire school.

When one student, whose only attempts at oral expression had been repeated displays of misdirected nervous energy, was asked to give a demonstration on how the blind learn to read music, he became interested and stimulated. He was allowed to use his instrument in his talk, and to him it was a most precious thing. The speech class had touched his special interest. He found joy and satisfaction in speaking, and he became a good citizen and an *A* student in the oral expression class. The pleasant experience lead to written stories and articles in the composition class, and the sub-

jects again were his instrument and lessons.

Another student was unable to work with a group without irritating all of his fellows. He was asked to help in directing a dramatization which his class was to present in assembly; and it was explained that a director must be heard and understood and that he must give suggestions and corrections with tact. After this experience the student asked for special help in his work and was soon volunteering to take part in activities planned by others.

A third student refused to respond to anything until he won first place in an amateur hour at the school. He played a "hill-billy" piece on his "fiddle." Through his liking for "hill-billy" music the violin teacher interested him in folk music. He became a member of the orchestra and asked if he might do his poetry project on ballads which would tie in with his study of folk music.

These cases serve to point to the power of success in the lives of students seeking some creative outlet. They also show the tonic effect of careful direction on the part of the teacher and counsellor.

When a student's physical resistance is low we administer some treatment to tone up his system. But in the case of mental irritability and temperamental maladjustment, there is also need for treatment. Fortunately, there is no necessity for elaborate diagnostic tests. We can see the signs by using our eyes and our ears. We can use patience, tact, and resourcefulness so as to gain the student's confidence and thus obtain an index of his special interests and ambitions. Once we know these things we can begin administering our mental and moral "vitamin B." The amount required and the length of treatment depends on the state of our patient, the student.

If the self-expression seeker has not found himself, a small amount of effort on the part of the teacher may bring him up to normal; but if he has suffered repeated failures in his search for a creative outlet, there may be complicating factors such as discouragement, bitterness, and lack of motivation.

The form which this "vitamin B" takes should be determined by the temperament and the ability of the student. But whatever the condition, the student must be made self-sufficient. He may need to return from time to time for further treatment, but he must not lean on his "doctor" for support once he has been discharged.

In our school a favorable reaction to the activity program has already been experienced. We have found, too, that there are other "vitamins" which will aid in toning up the mental and moral fibre of students seeking some means of self-expression,—some creative outlet, some method of gaining success and approval, but participation in activities, collectively or individually, is "vitamin B" *par excellence* for the visually handicapped child.

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tellectual stimulation in the case of the blind child, with its resulting lack of dynamic conceptual thought, which lead to the intensive studies of vocabulary and language development which had been under way at the Arthur Sunshine Home for the last three and a half years before its closing. (Maxfield, K. E., The Spoken Language of the Blind Pre-School Child: A study of Method. *Arch. of Psychol.,* No. 201, 1936. 100 pp. Columbia Univ.; and Maxfield, K. E., Building a Pre-reading Vocabulary for Small Blind Children. *The Teachers Forum,* XI, 2, 1938, pp. 35-39; XI, 3, 1939, pp. 43-48, 56). Some day the additional data accumulated on the language study will be published in the hope that at a more fortunate time someone will be interested in carrying the work further.

The blind and the deaf are by no means the only people who use words inaccurately and vaguely. Have you read I. L. Kandel's editorial in the May, 1940, *Educational Forum* in which he proves by practice that the careful use of words does not preclude effectiveness in style. For instance, it would seem to be reasonably accurate to say that "a cliché is a bromide with the fizz gone out of it," although the dictionary calls a cliché "a hackneyed literary phrase."

Vocabulary Building in Primary Reading

Alice Chatfield

So much depends upon reading, and beginning work in braille reading should be strongly motivated so that the pupil will learn to make the correct associations between the spoken word and its symbol. It is very probable that the acquisition of a strong desire to read depends largely upon the instructional techniques which are employed. The most modern systems of teaching reading make use of a combination of the sentence method, the word method and the phonic method, to introduce reading as a thought-getting process.

A blind child in approaching reading for the first time is not entirely without some of the equipment essential for learning to read. For one thing, he has had experiences; that is, he has heard things; he has come in contact with innumerable objects, events and activities. These experiences have given him concepts and ideas and from these he has acquired a mental background for understanding what the braille symbols of thought express.

In order to make the recognition of words and their pronunciation automatic performances, they should be brought before the child in a variety of ways. The child takes pleasure in learning the names of all the objects found in the schoolroom and in arranging or grouping them according to some plan related to a form of activity with which he is acquainted. This same interest in naming, arranging or classifying objects extends to words. These are associated with activities, with objects, with models, (see the March, 1939 issue of *The Teachers Forum* for illustrations of models), and grow out of conversations about the home, pets, games and the like, in a very natural manner.

The materials used in such a procedure are the class bulletin board, flash cards, peg boards and the new "chart assembly" boards which I developed with the assistance of Mr. O. J. Hill, Supervisor of Classes, and Mr. James McAuley, of the industrial department.

Mr. McAuley lists the equipment as follows: chart assembly boards (one for each pupil), a brass plate cutter, and a forming press. This equipment must be used in connection with a braille stereotype machine. The chart assembly board has a flat surface, horizontally lined, with tiny grooves, three-eighths of an inch apart. In reality, this board is made of many strips of masonite placed close together and fastened to a piece of plywood. The strips are one-fourth inch thick and three-eighths of an inch wide at the bottom where they fasten to the plywood base. With flat tops, and sides sloping in toward the base, they are the lines on the chart assembly boards. An explanation of the process involved will perhaps clarify the use of the equipment.

The desired words, such as: house, door, window, table, chair; and names of pets, objects and the like, plus the word lists from basic readers, are brailled by means of the stereotype machine on standard brass plates. These plates are then placed in the cutting machine which cuts the words apart, leaving an even half-inch margin all around the word or phrase. These cut words are placed in the forming press and the upper and lower margins are bent down and in, to fit the grooves on the assembly boards. These shaped words and phrases slide into the grooves from the ends. After the sentence or phrase, or list of words is complete, a convenient lock closes the ends of the lines, thus preventing the plates from sliding off.

The children have responded creditably, and through use of this chart assembly board in conjunction with braille reading have acquired more extensive and comprehensive vocabularies than in previous years.

Practical Cooking

Dorothy Snell Murphy

The expression by many of our boys of a desire to know how to cook, caused Perkins Institution to establish, three years ago, an elective cooking class for senior boys. No attempt was made to teach advanced domestic science. The aim was to give the boys enough instruction and experience in everyday practical cooking to enable them to prepare ordinary breakfasts, dinners or suppers for themselves or their families, should such a need arise. The number of boys to be admitted to the class was limited to five. The course was carried out along progressive lines and the boys "learned by doing."

They became familiar with the names of the ordinary cooking utensils, terms used in cooking directions, the interpretation and following of recipes, etc. In order to make their experience as practical as possible, they devoted one half hour each Monday to taking down menus and recipes, with directions. Foods and methods of their preparation were discussed. On the following day at three o'clock the boys arrived in class with their recipes, prepared to cook their own suppers. Each boy carried out the complete menu himself. Suppers were simple at first, but always consisted of three dishes to be cooked. Close supervision was given to each operation, but no help was given except in a demonstrative way. The preparation of supper and breakfast dishes was gradually superseded by the cooking of dinner dishes. By five-thirty or six o'clock, the dinner was ready; all pots and pans washed; table set; and the boys, with their teacher, enjoyed what they had prepared. After ten lessons, the boys were allowed to invite to meals from one to three guests. By the end of the seventeenth lesson, the boys had prepared practically all kinds of vegetables, several of these in different ways; had cooked chops, steaks, Hamburg, pot roast, fried canned chicken, fruits, and eggs. They had made seventeen different desserts, including cakes, pies, puddings, ice cream, etc.

Beginning with lesson eighteen, the boys were expected to plan the menu and execute its preparation absolutely without instruction. Dishes which they had previously learned to prepare were used for the most part, though the boys were allowed to make any selection provided they felt capable of preparing the same from the recipe without advice or assistance from the teacher. Each boy in this year's class made a fruit cake for his mother at Christmas and a jar of mince meat at Thanksgiving time.

After the Easter vacation, each class gave a party. This varied according to individuals and plan. The first party was for all of the teachers, house mothers and masters with whom these particular boys came in contact. Refreshments, consisting of ice cream, frosted cup cakes, date nut bread sandwiches, and punch, all of which were prepared by the boys, were served. The second class gave a surprise party to the married couples of the executive staff, which took the form of a dinner dance. A real chicken dinner was cooked and served by the boys. This year's group invited twenty-four girls and boys from among their own friends to a dance, serving ice cream, cookies and punch which they had prepared.

At the end of each year an examination is given concerning foods, cooking terms and methods; and, as a part of the final test, muffins, a cake and a pie are baked by each boy and inspected for texture, etc., by a dietitian. I find that the totally blind boys do just as well as the boys with some sight except for a little less speed and slightly more spilling.

This year (1938-39) we have begun a cooking class with a special group of seven retarded children of various ages. These chil-

dren have a two-hour lesson and prepare just one item. They have made simple desserts, also cookies, cup cakes, gingerbread, biscuits, muffins, cocoa, sandwiches, shortcakes, salads, etc. After their class these children wash the dishes, set the table for themselves and two teachers, and then enjoy together a little tea party, eating what the children have prepared, and with milk or tea as a beverage. It has been quite surprising and most gratifying to note the progress in manipulating cooking utensils, measuring and mixing, and general procedure made by these children. Incidentally, an excellent opportunity has been afforded them to use some of their arithmetic practically.

The work in these classes is planned to suit the capability of the various pupils. The subject has been so greatly enjoyed that there is an increasing number of requests for admission to the classes.

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course dinner was given for the members of the social club by the faculty advisers in the department of home economics. The guests were carefully attired and showed marked ability in conducting themselves with grace and poise. On this and similar occasions the boys and girls have a combined meeting of both groups, and as the majority of the students are members of this club they find these social activities of considerable personal value.

There is no better approach to a broad education than extracurricular activities designed to lead to social adjustment in adult years, and in the student clubs the superintendent and faculty feel they have found a happy solution to the problem of combining instruction and play.

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ticipation in the classrooms which are receiving the broadcast. To induce this activity, radio lesson guides are prepared. The classroom teacher knows in advance what is expected of her and of her pupils during the broadcast. These lesson guides are quite elaborate. Every lesson is preceded by a set-up showing what the teacher has to write on the board and what the activities are. Visual material is used when necessary during the lesson.

"One fine development of the use of broadcasting is an increased interest in speech. Everybody is becoming more or less radio-conscious. Tests are showing that many speech defects are the result of auditory defects. Perhaps many of us who are in sight-saving class work have not paid enough attention to the auditory condition of our children."

The Teachers Forum
for
Instructors of Blind Children

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SEPTEMBER, 1940

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Problems in the Education of the Blind

HARRY SPAR

THE fact that large numbers of blind persons exhibit certain traits of personality and intellect which seem to deviate sufficiently from what is generally expected in "normal individuals," and which are sufficiently common among the blind to be considered characteristic of them, has led some workers for the blind to advance the theory that there exists a "psychology of the blind." This theory implies that certain thoughts, feelings, attitudes, and reactions of the blind which do not fall in with our conception of the normal are invariably linked with the condition of blindness. First of all, it overlooks the fact that many blind persons do not exhibit any significant intellectual or personality deviations and, second, that almost all such variations can be corrected or—better still—prevented, by proper and careful education. Taking these considerations into account, it appears logical to conclude that although the lack of vision is the most conspicuous condition common to those persons who come under the classification of blind, the presence of deviations among the blind is due essentially to a wide variety of psychological problems which are not attributable to the condition of blindness itself, but rather to certain inadequacies in the educational process.

Therefore, to discount the theory of the existence of a "psychology of the blind" is not to overlook the fact that blindness presents a large number of definite and undeniable psychological problems which the educator of the blind must solve if his work is to be truly effective. It is to be regretted that teachers of the blind in general, even at this late date, are inclined to view the research that has been done with regard to problems of perception and experience of the blind, as having little more than a philosophic interest. However, many teachers today are rapidly coming to see the importance of the work being accomplished in mapping the capacities and achievements of individual blind persons. The progress that has been made during the past few decades in developing facilities for psychological testing and measuring is largely attributable to the recognition, on the part of teachers of the blind, of the practical value of this work. Although its importance should not be underestimated, it must be further recognized that, in the main, it is designed to show what blind people have achieved through maturation and learning and to indicate how much more may be expected. It does not purport to tell *how* blind people have progressed to their various stages of development, by what special techniques and emphases their learning can become more meaningful to them, or wherein their achievements may be augmented. The work of the psychologists in the field of the education of the blind will not be complete until these broad problems are effectively attacked. The serious and widespread cooperation of the teachers in the field is one of the most important prerequisites to this undertaking.

No doubt, one of the factors responsible for the relatively tentative state of information concerning the nature of perception, thinking, and emotional reactions of the blind, is the extreme complexity of the psychological implications of blindness. The highly heterogeneous character of the group which comes under the legal definition of blindness makes impossible the application of any given set of special, educational principles to them as a whole. It is as much a mistake, for example, to apply the special methods of teaching totally blind children who have never seen to the teaching of children with useful vision, as it is to teach the blind by the methods which are most satisfactory in the teaching of those with normal vision. Parenthetically, it might be well to point out that children with useful

vision might include a variety of cases ranging from those with a visual acuity of, say, 20/200, to those who have mere form perception but a strongly visual type of mind, and those who have become totally blind at a late enough age to retain useful visual images. Within this wide range there might exist an indefinite number of groups of children whose special needs would suggest an equally varied collection of fairly distinct sets of methods and principles of teaching. Further complicating the situation is the necessity of taking into account the different types of imagery—visual, tactual, auditory, or motor—in relation to the amount of vision a child may possess.

Considering the complexity of this phase of the education of the blind, it is understandable that many of us have tended to veer away from the seemingly hopeless maze of intricate details and turn our attention to the more general and obvious problems in our field. In so doing, however, we have not only been inclined to neglect a very essential phase of our work but we have also failed to apply many of the psychological findings which might materially contribute to the solution of some of our most troublesome problems in the field of the education of the blind. Further study and research promises to reduce the complexity of many of the psychological problems of blindness; and, although these problems do not lend themselves to extreme simplification, practical solutions are not only possible but, to a large measure, already available.

One of the problems which might be studied to considerable advantage is the onset of the dominance of one type of imagery over all other types in the course of the development of the child's thinking. From present indications, the dominant type of imagery does not seem to be determined by the degree of efficiency of the sense upon whose functioning it depends. Very weak-sighted children have been found with dominant visual imagery; and, contrarily, normally-seeing children are sometimes found with imagery which is strongly auditory, tactual, or motor. The dominant type of imagery is either determined by very early education, or, as does not seem unlikely, by heredity. In the first case we might hope eventually to influence the degree of dominance of the different types of imagery in the direction of greater coincidence with the actual efficiency of the sense upon which they depend. If heredity is, however, the determining factor, we may hope at least for early clues as to the sort of emphasis which will bring the best results in the teaching of a given child.

A problem which many teachers have been rather reluctant to discuss because of its seemingly personal nature and which, perhaps for this reason, has failed to receive the serious study it warrants, is that of developing proper facial expression in the blind. The meaningless mask-like expressions which appear on the faces of some blind persons in response to almost any type of emotion felt, the almost perpetual grin of others, the supercilious smile or grimace of one kind or another involuntarily distorting the faces of still other blind persons, are familiar to most of those who have had any extensive contacts with the blind. Improper facial expression assumes various forms and may occur in many different degrees among the blind. There is probably no single condition from which the blind are apt to suffer that tends to isolate them more from the society of seeing people. Society in general is accustomed to judge the individual largely by what may be read in his face; and if the facial expression of an individual is blank, supercilious, or enigmatic, the average observer will not stop to inquire into the possibility that there might be a psychological or educational explanation for this condition. He will attribute to it its usual significance and will infer from this that the individual with the peculiar expression is, in some way, as peculiar as he looks. The peculiar have little in common with the normal. Consequently, the blind person is often supposed to have little in common with seeing persons among whom he must live, and, accordingly,

he often finds himself treated as an outsider. Yet, there are blind persons who do not exhibit improper facial expression to any noticeable degree; and this should suggest that the condition of improper facial expression is not an inevitable outgrowth of blindness but rather a problem of the education of the blind.

Two methods are currently recommended for treating this condition. The first is to allow the blind person to observe tactually, by studying the faces of his teachers and friends, the various expressions which are the normal responses to the different types of emotions experienced; and the second is to encourage the blind person to study the expressions of others in terms of his own autoplastic experience in relation to those expressions.

On careful consideration, the first method will be found to be rather impracticable. Although it seems quite feasible that larger displacements of the face occurring, for example, in a pout, or in a smile, can be observed tactually, it is not possible to trace the finer displacements which give meaning to either of these expressions or which constitute the difference between, let us say, a frown and a scowl. Assuming even that the weight of the fingers on the face would not erase the finer differences between the various facial expressions and that these differences would be perceivable through touch, it is very likely that the face would react to even the most delicate palpation and, consequently, change its expression. Furthermore, to afford a blind person a complete knowledge of the detailed differences between the various expressions in other people's faces is not providing him with the slightest clue as to how he might reproduce these various expressions in his own face.

Apropos of this, it may be interesting to some teachers to know that although a practical objective perception of facial expression seems to lie beyond the ability of those who do not have sufficient vision for such perception, it has been my experience that blind persons may derive much valuable information as to the meaning of various facial types —such as the "weak face, the strong face, the orator's face, etc."—by the use of masks which have been actually taken from various characters. In this connection the use of statues has been tried and found relatively unsuccessful. The sculptural representation of faces usually produces a face whose contour is described in gradual curves in order to give to the eye the impression of the proper fullness of the face. However, when a mask is made it is ordinarily taken from a prone position which causes the flesh to recede and give a more pronounced and angular appearance to the distinguishing characteristics of the facial contour. Since angles are more significant for touch perception than curves, blind persons derive a much better concept of the differences between various types of faces by the studying of masks than by any other method which has yet been tried. Enriched by experience obtained in this way, many phrases used in literature, drama, history, and everyday conversation to describe persons living, dead, fictitious, will assume far more real meaning to the blind.

The problem of developing proper facial expression among the blind is not to be thought of as a single problem for which a single solution might be found; but, if it is to be treated with success, it must be understood as comprising a complexity of numerous and distinct problems which, though having the same general effect, arise from widely different causes and require, consequently, widely different individual treatment.

Probably, a lack of facial expression is most frequent among the blind. It may vary from the mask-like expressionlessness referred to above to merely a mild sort of stolidity, which is conspicuous only when it appears incongruous with the general personality and intellectual characteristics of the individual exhibiting it.

Individual case studies reveal that the childhood of blind persons who suffer from this form of improper facial expression is com-

monly marked by a prolonged period of highly limited activity and of very restricted objective stimulation. This period would, of course, date from very early infancy in the case of the congenitally blind person; in that of the adventitiously blinded person it may date from the onset of blindness if blindness occurs before sufficient objective concepts and relationships have been established to sustain normal emotional experiences.

Two facts suggest a logical and practical explanation for the frequent occurrence of improper facial expression among the blind: first, facial expression is one of the results of emotions and consequently normal facial expression is dependent upon normal emotional experience; and, second, facial expression resulting directly from the activity of the facial muscles, can be normal only when the condition of these muscles is normal and healthy.

Unfortunately, as has already been suggested, few blind children enjoy the opportunity of experiencing normal and adequate emotional stimulation. A child who is free to move about and exercise his mental and physical abilities in the course of his everyday activity will experience pleasure, grief, pain, anger, love, etc., which comprise the gamut of human emotions, and will express these emotions naturally without any conscious effort or special instruction; in so doing, he will develop normal responses. The highly restricted activity which marks the childhood of far too many blind persons does not permit anything approaching normal emotional experience, and the expressions therefore are likewise limited. What effect this restriction may have upon later emotional development is a problem not yet thoroughly investigated; but even if we assume that despite this early restriction later emotional experiences can proceed normally, there still remains the second factor which must be considered in connection with improper facial expression among the blind. Since facial expression is the direct result of the activity of the muscles of the face it must inevitably be subject to the same laws that effect muscular development. The prolonged disuse of any muscle is known to result in a loss of muscular tonus and a consequent lessening in muscular responsiveness. Thus, immobile meaningless expressions may, in many instances, be attributable to a lack of responsiveness in the muscles of the face rather than to anything that can be corrected through instruction or imitation. Possibly, physiotherapeutic treatment might improve the condition of the facial muscles and result in improved facial expression if the emotional experience of an individual is approximately normal; but, aside from this bare possibility, there is much reason to question whether facial expression in the adult, who has not possessed it for any considerable length of time, can be properly developed.

The admonition that one must smile and look pleasant, which teachers frequently give to blind children who exhibit early signs of facial immobility, is probably responsible for the two forms of improper facial expression which are even more objectionable than the complete lack of facial expression. Both the perpetual, insipid, meaningless grin --reminding one of the proverbial Cheshire cat—and the equally meaningless recurrent smile, signifying nothing but a pathetic attempt to look pleasant, are, according to blind people's own testimony, frequently the result of conscientious efforts to follow the well-meant, but ill-founded, advice of teachers, parents, or friends.

Blind children who do not receive adequate objective stimulation will, almost invariably, resort to self-stimulating activities. The more conspicuous of these—such as manipulating parts of the face, swaying the body, waving small objects before the eyes, etc.—are commonly designated as "blindisms." One which generally escapes criticism, because it is likely to be erroneously attributed to local nervous degeneration or under-development, is the periodic distortion of the face. This distortion may assume the shape of anything from a

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A Survey of Physics Courses in Schools and Classes for the Blind

H. J. Hebbeln

The education of the blind has as its general objective the training and developing of the visually handicapped individual so as to make possible the enjoyment of the most nearly full and normal life. In the struggle towards this objective the past century and a quarter has brought forth a phenomenal development of educational methods and materials, far exceeding that of all preceding centuries. However great this progress there is no disposition among educators to feel that their work is complete. Problems of long standing still remain unsolved while new problems arise as the demands upon education are increased.

In the field of secondary education for the blind much has been accomplished to the end that pupils on this level compare favorably with those of normal vision. However, where the concepts and skills involved require supplementation and enrichment beyond that of the printed page, such as laboratory work, a definite problem arises—that of providing a maximum amount of this enriching experience in the face of the limitations imposed by lack of vision.

Science courses are taught in nearly all schools for the blind which offer work on the secondary level. In the larger proportion of schools these courses are in general science for which it is somewhat easier to provide experimental facilities. The General Science Committee of the American Association of Instructors of the Blind made available in 1933 a *Course of Study in General Science* for use in schools for the blind. This course contains a large number of elementary demonstrations and experiments, comprising a very valuable activity program. Forty-three of these are related to the field of physics, and although only a portion are suitable for further study in a course in physics, they suggest the possibility of a similar course of study being prepared, if it can be determined that there is definite need for such a manual.

It is the purpose of this study to determine to what extent physics is being taught in schools and classes for the blind, and what provisions have been made for laboratory work on the senior high school level. Also, an attempt is made to determine the degree of uniformity of the courses offered in the various schools and classes. The study is in the nature of a survey by the questionnaire method, of the status and development of physics courses in those schools and classes that include the course in their curricula. By this means answers are sought to the following questions:

a. To what extent are physics courses included in the curricula of schools and classes for the blind?

b. To what extent have adaptations in the experimental work in these courses been made in order to compensate for the lack of vision?

c. Are courses in physics in the several schools and classes for the blind sufficiently uniform to indicate the desirability of a manual of adapted physics experiments?

As a final outcome it should be possible to offer certain recommendations in regard to the nature of future developments in this branch of subject matter.

PROCEDURE

The possible sources of information in a study of this kind include residential schools for the blind as well as the day classes for the blind which are maintained as a part of the larger public school systems, supplemented by institutions for the education of the

blind in foreign countries. Obviously, where political or cultural differences exist, local institutions usually show modifications which reflect these differences.

Since this study attempts to determine the status and nature of work in physics offered for the blind, it will be helpful to consider the facilities for laboratory work provided by each type of school. In at least some of the day schools no effort was made in the past to offer physics to blind students, but substitute provisions were made according to the following statement from the report of the Committee on Physically and Mentally Handicapped of the White House Conference on Child Health and Protection:

> In every city supporting braille classes, blind children are given the opportunity to take the full high school course, usually substituting some literary course for the science course.

A comparison of this statement, published in 1930, with replies from the day schools to the questionnaire used in this study may indicate important trends in this group of classes.

The residential schools for the blind apparently have carried on more work in science in the past. In addition to general science, the writer has offered work in physics to small classes of blind and partially blind high school students (at the New Mexico School for the Blind) in alternate years since 1928, using progressively improved laboratory facilities. Other schools are known to carry on work of a similar nature. The advantage which the residential school enjoys lies in the fact that when courses of this kind are offered, they are intended primarily for blind students, thus giving first consideration to their needs. The accompanying laboratory work must present concepts in a manner that makes the lack of vision a minimum obstacle.

The purpose of the questionnaire was to secure the basic information required in this study, but for reasons of convenience the sequence varied somewhat from the order in which the problem was outlined.

Schools Offering Physics

In the first place it was considered necessary to determine the proportion of schools in each classification, day or residential, that offered physics courses on the senior high school level. This question was stated as follows:

Is secondary school physics included in your curriculum? The replies were divided into two groups, each of which provided information used in a subsequent query.

Reasons for Not Offering Physics

The second query was directed to those schools whose response to the first was in the negative. It was important to determine why certain schools do not offer physics courses, since this has a very definite bearing on the status of the curricula. It is possible that in the future some of these schools may include physics and a statement of reasons for not offering the subject might provide an indication of such a trend. Also, by pointing out obstacles and objections, it might be possible to initiate a new approach to the problem.

For simplicity of tabulation it was considered advisable to present under this second query a limited number of the most probable responses, and an opportunity for a statement of unclassified reasons. The latter, if sufficiently outstanding, might point to situations unforeseen or not anticipated.

The factors involved in setting up this group of responses might be stated as follows: a. Are satisfactory texts available, particularly in braille? b. Are experimental facilities available? c. Would such a course help to satisfy the needs of pupils in schools for the blind? The second query therefore read:

If your school does not offer a course in physics, please indicate the reason according to the following:

a. Lack of suitable text material.....
b. Lack of satisfactory experimental facilities .....
c. Do not consider a physics course suited to the needs of pupils in this school....
d. Other reasons .....

TABLE I

NUMBERS AND PERCENTAGES OF SCHOOLS FOR THE BLIND TO WHICH QUESTIONNAIRES WERE SENT, THOSE REPLYING, AND THOSE TEACHING PHYSICS

	U.S. Residential		*U.S. Day Classes*		*Foreign Residential*		*Total*	
	No.	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*	*No.*	*Per cent*
Questionnaires sent out	45	100	20	100	16	100	81	100
Replies	35	78	13	65	8	50	56	69
Teach physics	12	34	3	23	4	50	19	34
Do not teach physics	23	66	10	77	4	50	37	66

The number of replies is used as the basis upon which the percentage of replies is computed.

TABLE II

DISTRIBUTION OF REASONS INDICATED FOR NOT TEACHING PHYSICS IN SCHOOLS FOR THE BLIND

Reason	*Number of times indicated*	*Per cent*
a. Lack of suitable text material	3	9.1
b. Lack of satisfactory experimental facilities	9	27.3
c. Course not suited to the needs of students in schools for the blind	9	27.3
d. Other reasons	11	33.3
e. No reason	1	3.0
Analysis of "Other Reasons"		
a. High school students sent to public high schools	4	36.4
b. Consider General Science adequate	2	18.2
c. Prefer other science subjects	3	27.3
d. Small classes, not enough teachers	2	18.2

Circumstances Attending Courses in Physics

As was indicated above, the third query, directed toward those schools whose response to the first question was in the affirmative, was concerned with the circumstances attending the presentation of physics courses. Factors involved in its development resulted in this listing:

If your school offers a course in physics please answer the following:

a. What texts do you use? .....
b. Do you have a manual of experiments especially adapted for students without vision? .....
c. If so, please indicate the title and author. .....
d. Please indicate whether the manual was devised in your school or elsewhere. ....
e. If you do not have an adapted manual, please indicate your practice on the following form.

The form consisted of a list of the divisions of physics with a five point scale indicating the degree of adaptability of experiments in each division.

The questionnaire closed with a request that the respondents include any additional material which instructors might think of value to the study. It could have been made considerably longer but it was felt that a larger proportion of answers could be expected if the simpler form were used.

The list of residential and day schools to which the questionnaire was sent was taken from several sources. A list of American schools was taken from the Directory of Activities for the Blind in the United States and

Canada while the names of schools outside this country were obtained from the American Foundation for the Blind and from the British Library of Information, both in New York. The total list of questionnaires sent out included forty-five to American residential schools, twenty to American day school classes, and sixteen to foreign schools. Many day classes were omitted because it was thought that only where the number of teachers exceeded three would there be a probability of special work in physics.

RESULTS

In all, eighty-one questionnaires were sent out to as many schools and classes for the blind and fifty-six replies were received, a response of 59.1 per cent, which is sufficiently high a percentage that the results can be considered reasonably representative. It will be noted in Table I that by far the great majority of these responses were from residential schools in the United States, with the day schools in this country a close second, proportionately. However, the replies from foreign schools give us important and interesting information which will be referred to subsequently. It might be added, parenthetically, that the existing foreign situation had no effect upon replies from other countries since all correspondence was completed before September, 1939.

Schools Offering Physics

The replies to the first question show that physics is not taught in a very large proportion of the schools and classes in the United States. This is due to a number of factors as indicated in the following discussion. Considering the replies from all types of schools, it is seen that thirty-four per cent offer courses in physics to their high school students. This, considering the possibility that others intend to offer the course or would like to do so, is a sufficiently large proportion to warrant the present study.

Reasons for Not Teaching Physics

Responses to the next item of the questionnaire are classified in Table II. Of the twenty-three residential schools in this country not offering courses in physics, nine consider the course as unsuited to the needs of students in schools for the blind. The remaining fourteen schools expressed no definite objection to the subject, and some might offer the course under the right circumstances. Therefore, the above-mentioned nine constitute the minority preferring not to offer the course.

Three of the responses show that there is a lack of satisfactory text material. Comparing the texts available in braille at the present time with the wealth of inkprint texts, it is reasonable to expect some dissatisfaction with the material in braille. There undoubtedly would have been more but for the manner in which texts are selected. A committee of educators carefully examines a number of available inkprint texts, and makes a selection of the works considered to be most usable and to cover the widest range of requirements in this particular field. The resulting list is presented by the American Printing House for the Blind to the various schools for consideration. When sufficient orders are tentatively placed for any given text, the work of embossing in braille is commenced. Thus, the range of selection is actually much wider than is apparent.

Nine of the schools do not teach physics due to lack of experimental facilities. This may be due to either or both of the following causes: first, the financial resources of the school may be too limited to permit the purchase of laboratory materials in any practical amount; second, the apparatus on the market is designed for use in public high schools and colleges and needs adaptation for use by the blind.

The above-mentioned fact that nine of the schools consider physics as unsuited to the needs of students in schools for the blind points to an important difference of opinion. Such a difference is to be expected, since the subject is an elective even in public high schools, showing that its value is not considered universal even to seeing students. It has considerably less meaning for the blind,

hence its inclusion in the curricula of schools for the blind may be regarded by some to be unjustifiable. It was even stated in some of the replies that because the subject matter is limited in terms of its immediate usefulness, the time can be better utilized in other ways.

The second part of Table II is devoted to a further analysis of the "Other Reasons." The most significant fact here is that in several states blind pupils are sent to public high schools. This shows a tendency to encourage these students to prepare themselves through the everyday environment of public school life for normal activities in the seeing world.

The reasons why public high schools do not offer physics to blind students do not fit into the proposed classification. Of the ten not teaching physics to the blind, seven stated that blind students at this level are sent to the state schools for the blind. A comparison of this answer with the response noted above shows that a variety of practices are in use, and the difference in circumstances under which schools and classes for the blind operate in various states makes this desirable.

Three other public high schools state that they have provisions for blind students to pursue work in physics with the regular classes. However, in these cases the enrollment of blind students is small and none has elected physics, so that it was considered incorrect to state that those schools teach physics to the blind.

Circumstances Attending Courses in Physics

Consideration of the final query of the questionnaire, dealing with the circumstances under which physics is being taught, was perhaps the most revealing factor in this study because the responses presented the real status of physics courses.

Of the two texts available in braille the replies showed that both were being used by the same number of schools. The one text, *A First Course in Physics* by Millikan and Gale, 1913 revision of the 1906 copyright, was embossed in 1924, while the second, *First Principles of Physics* by Fuller, Brownlee and Baker, 1933 copyright, was embossed in 1938. Since each of these texts was listed by eight schools shortly after the second was brailled, it may be assumed that the newer text is preferable. In several cases both texts were in use. Instructors generally supplement these with material from other inkprint texts, and supplementary reading material is usually available in the braille libraries. Reports from some foreign schools indicated that they either embossed their own texts or used printed material in connection with the lecture method.

One school stated that a manual of physics experiments was in use, but since it was still in typewritten form it was not available for examination. In nearly all cases, both American and foreign, it was indicated that some form of adaptation was followed. According to the responses regarding the relative degrees of adaptability of experiments, six instructors stated that almost no experiments in "light" could be adapted. In all other divisions of the subject matter the majority indicated that experiments were either easy to adapt or that it was unnecessary to adapt them. This shows, therefore, that instructors in schools for the blind generally endeavor to suit their laboratory work to the needs of their students and that this is accomplished with varying degrees of success. Since every division except "light" showed such a large number of possibilities in laboratory work, it seems probable that a list of experiments in each division could be worked out, according to several types of adaptation.

Laboratory work in day classes was carried on through the use of several interesting methods. Some schools followed the procedure of assigning a seeing student to work with a blind one, the two thus helping each other. Other schools arranged for all blind students to work together with their instructor as a separate laboratory unit. In these cases some instructors made use of as much adaptation as possible, while others insisted

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New Reading Practices

BERTHOLD LOWENFELD, PH.D.

IT is generally recognized that practically all formal learning depends upon the individual's ability to read. Comprehension and speed are the two factors determining the pupil's success in reading and are therefore of the utmost importance for his general progress in school. The aim of any reading medium devised for the blind is, of course, to bring them to a par with the seeing. How far has braille reading helped to achieve this and wherein are its possible shortcomings?

Although we cannot refer to any particular study on possible differences in comprehension resulting from the use of braille as a reading medium, as compared with ordinary reading, the extensive use of braille, particularly in tests, has sufficiently proved that, in itself, braille is no obstacle to the proper development and efficiency of reading comprehension. Reading comprehension depends mainly on general intelligence, amount of reading and command of vocabulary. It is interesting to note in this connection, that on the whole the rapid reader also shows a better comprehension or, to put it differently: rapid reading is no obstacle to comprehension.

While we have stated that there is apparently no limitation in comprehension imposed on the blind by the use of braille, there is one clear disadvantage to which braille readers are subjected—the slowness of braille reading with all its consequences. "Blind children read only about one-third as fast . . . as seeing children having the same number of years' experience in school work."[1] This factor has very serious educational implications. It means that blind children are necessarily curtailed in the acquisition of information and the enrichment of their experience derived from reading because they can read only a fraction of the amount which their seeing companions are able to cover in the same period of time. This situation is further aggravated by the fact that blind children must so frequently depend upon reading, where and when seeing children need only experience.

The effect of this disadvantage is shown in the results of the "New Stanford Achievement Test" in various schools throughout the United States as presented in the accompanying graph.[2]

The graph indicates the achievement of our pupils in nine tests: Paragraph Meaning, Word Meaning, Dictation, Language Usage, Literature, History and Civics, Geography, Physiology and Hygiene, and Arithmetic Reasoning. The curves clearly show that the lowest achievement occurred in literature and history. This may be noted not only in the individual curves for the three eastern schools but also in the combined curve for seven schools. Dr. Samuel P. Hayes comments that "the tendency of the curves to drop down in literature and history as compared with geography, would seem a pretty good indication that schools for the blind have not succeeded in giving their pupils the background in these subjects which they have been able to give in geography."

There is only one satisfactory explanation of this deficiency. It is the insufficient amount of reading done by our students as a necessary outcome of the use of braille. This is evidenced by a review of the questions asked in the literature and history tests. The literature test includes such questions as: "Twenty Thousand Leagues Under the Sea" tells of—Puck, Captain Nemo, Uncas; Lord Fauntleroy always called his mother—Darling, Dearest, Honey; "The Crimson Sweater" is a

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[1] Hayes, Samuel P. "Practical Hints for Testers." TEACHERS FORUM, XI (1939), No. 5, 89.

[2] The writer is indebted to Dr. Samuel P. Hayes for the use of the material on the results of the Stanford Achievement Test.

story of Athletics, Love, War; "Bob, Son of Battle" tells of a—Boy, Dog, Horse. The history and civics test includes such questions as: The name "Old Ironsides" refers to a—Man, Mountain, Ship; the "Rough Riders" were led by—Pershing, Roosevelt, Sheridan; the Boxer Rebellion occurred in—Japan, Cuba, China; next in importance to agriculture in 1860 was—Mining, Lumbering, Manufacturing. All these questions presuppose a fund of knowledge acquired by a great amount of reading. Many of the literature questions may be answered only if the student has read the book in question and many of the history questions refer to facts which may be sufficiently absorbed only by extensive reading of historical literature. A seeing student—and the Stanford Achievement Test was prepared for this group—acquires information and deeper understanding by supplementary reading which is, at least, as important as textbook study. The blind pupil is confined to a much smaller amount of actual reading and cannot, therefore, compete with the seeing student as long as his slowness in braille reading is not compensated for by some other method of assimilating reading material. Only then will the blind student attain the necessary background which will enable him to draw effectively upon a sufficient store of information to answer these questions satisfactorily.

All the ingenuity which teachers of the blind have applied to promoting the effectiveness of braille reading has not eliminated this disadvantage, a factor certainly contributing to the assumption that the educational achievement of blind children falls behind that of the seeing child of the same age and intelligence.

Within the last years, a new reading medium, the Talking Book, has been introduced to the blind which makes possible greater speed in reading. "The average speed of braille reading is less than one hundred words a minute, while that of record reading is about one hundred and eighty words."[3] This statement, of course, does not take into consideration the fact that the average speed cited for braille reading is attained only as a result of constant training during the educational period, while pupils in the various grades show a much slower speed which varies with their years of practice. Only if we consider this factor are we able to appreciate the real advantage of Talking Book reading with regard to speed. The question arises now as to what practice in actual classroom procedure will enable the teacher to utilize this new reading medium to the best advantage.

Talking Books may be used in class while the children listen as a group, the teacher meanwhile checking and explaining whenever advisable or necessary. A Shakespeare play, for instance, may be read in this way; or the students may listen to the play and, at the same time, follow it in the braille text. This dual procedure of listening and reading has been highly acclaimed by teachers of seeing students. "The students, many for the first time, and all too many for the last time, will hear Shakespeare's language given body and fulness; they will see through the mind's eye, characters come to life."[4] All this will be even more true with blind students. In addition, the speed of braille reading may be favorably influenced by this practice because the intelligent interpretation presented by the professional reader on the Talking Book allows the blind student to concentrate his attention to a greater extent upon the technicalities of his braille reading. He may thus follow with greater ease the spoken word and derive increased comprehension and satisfaction from his reading.

The teacher now has at her disposal a considerable amount of literature in Talking Book form (listed in the catalogue, *Learning by Listening*) from which she may select and

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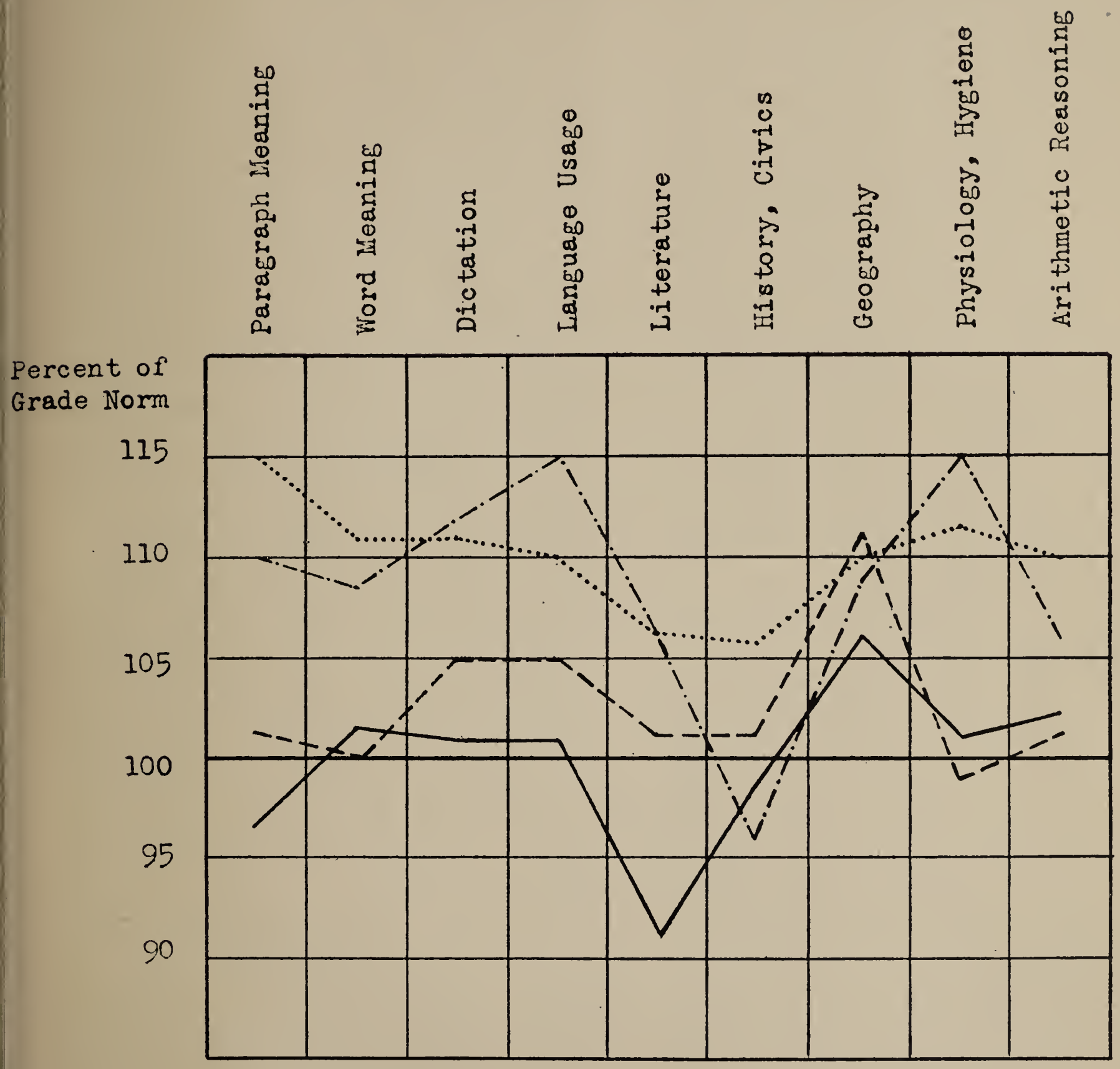
[3] Rodenberg, Lewis W. "The Story of Books for the Blind," *What of the Blind,* Helga Lende, ed., American Foundation for the Blind, New York, 1938, p. 172.

[4] Lass, A. H. and Steingart, C. S. "Recordings and the English Classroom." *High Points,* New York City Board of Education.

RESULTS OF THE STANFORD ACHIEVEMENT TEST IN VARIOUS SCHOOLS FOR THE BLIND



assign to the student for home reading such works as she may deem useful and thus save time for those books which must be read in braille. In this way, the student will become acquainted with many more books than has heretofore been possible because the teacher can assign a much larger portion of a work to be read on the Talking Book than she can possibly expect the student to read in braille. *A Tale of Two Cities* by Charles Dickens, for instance, has been recorded on twenty-four records which require approximately twelve hours of continuous reading by listening. It would take a student at least two or three times as long to read the five braille volumes of this novel. Outside assignments presuppose that Talking Book machines are available to the student in the study hall or in his living quarters. The Library of Congress is at the present time distributing a new allotment of Talking Book machines to schools all over the country, thereby facilitating the use of Talking Book machines outside of the classroom.

In many schools it is still a custom to have "reading periods," particularly for the lower grades, in which the teacher reads aloud to her group of children. The Talking Book can now be substituted for such reading and the teacher's time released for other activities.

The American Printing House for the Blind has recorded a considerable number of children's books selected from lists prepared by the Talking Book Education Project of the American Foundation for the Blind. The compilation of these book lists was based on a thorough review of children's literature in consultation with the New York Public Library and the library of Teachers College, Columbia University. Such titles as: "Street of Little Shops" by M. W. Bianco, "Willow Whistle" by C. L. Meigs, "Dick and Tom" by M. Van Doren, have been recorded and the demand for these books clearly evidences the need for such material. Some of them like "America Travels" by A. Dalgliesh, the story of a hundred years of travel in America, "Farmer Boy" by L. I. Wilder, a picture of life on the farm seventy years ago, or "Turi" by H. L. Williams, a story of early man and prehistoric days, may be used for classroom reading and will greatly enrich the course of study.

"Across the Isthmus, the Story of the Panama Canal" is the first study unit in a Talking Book series entitled "Our Changing World," which will include such units as: "Wires Round the World, the Story of the Telegraph," or "Wings Away, the Story of the Airplane." For the first time, a new technique has been applied by presenting dramatized scenes with realistic sound effects wherever the narration offers an opportunity. Jasper, a little New York youngster, visits the Panama Canal and takes a boat through the locks while the lock keeper explains the workings of the canal system. The history of the building of the Panama Canal is presented in dramatic sequences and a well-rounded picture of its importance is unfolded. Every care has been taken to make the presentation understandable to blind children and to keep the vocabulary within the limits of the junior high school level. A spelling list of unfamiliar words is included on the last page of the record. Study units like this may be read to supplement the various subjects whenever the teacher comes to the point where she can utilize the study unit as a whole or in part, or they may serve as a central core around which the teacher may build a class project.

Such projects are an integral part of progressive teaching which is based on and supported by the newer findings in the field of psychology, particularly in the psychology of learning. In the traditional classroom procedure, the teacher and the book represented the main sources of information and the material was supposed to be transferred to the student by a process based on the theories of the "association psychology"—a mechanical conception of learning. Progressive teaching stresses the importance of the project method in which a given situation is experienced as a whole—a unit—and is supported by the theories of Gestalt psychology where

(*Continued on page 39*)

Dr. Allen Says:

What of the Future?

When students of the education of the blind put to me the above question I reply somewhat as follows:

In both Switzerland and Italy I found the young blind who are mentally deficient placed in institutions off by themselves, they being not educable but trainable only. Our Dr. Burritt once got a group of superintendents of the feeble-minded to acknowledge that those who were also blind rightly belonged with them; yet, because, however many and big their institutions are their waiting lists are still bigger, we should seek other means of solving the problem unhappily thrust upon us. When Massachusetts was planning its third plant for the feeble-minded, I proposed at a legislative hearing that a department for the state's uneducable blind be included, pleading their cause thus: bright and dull children do not work or play profitably together, and because the bright blind are about the most promising educationally of any handicapped group, it is sheer defeatism to school all sorts and conditions together; moreover to do so is unkind, unscientific, and uneconomical. I said that since this is true I had been discharging from Perkins about fifty uneducables a decade, so banishing these innocents to vegetate back home.

My arguments falling upon deaf ears our school for the competent blind inevitably harbors obstructionables. A mother of a bright blind boy once brought him some 1,500 miles to become a private pay pupil at Watertown. But on seeing there some doubly afflicted boys with conspicuous mannerisms she refused to leave her son in such abnormal companionship. The classes which Harvard now sends to visit there are composed of students in social pathology! I have told their professor that could I in 1910 have believed it possible for the prevention of blindness movement to operate so soon and so effectively as it has done to lower the proportion of the educable blind I should have built differently—at Watertown only after the present ideal plan, for the promising, but for the rest, a much simpler environment off somewhere where they could thrive happily in togetherness of spirit, trained and employed in simple agriculture, housework, and other reasonable pursuits.

Such planning of both these plants would have been in accordance with the later demand of the White House Conference on Child Health and Protection, which is, that "the handicapped child should be so guided that his aptitudes and abilities may be given the fullest possible development."

Doubtless Director Anagnos hoped to make Perkins rich in funds as it is in equipment and so, like his kindergarten, independent of potential state interference. I, intimately knowing the Royal Normal College, London, and its scholarship system, naturally toyed with the idea of making Perkins a select school. But it was not to be.

Since most of our residential schools are admitting more and more children not "educationally blind," surely some less unjustifiable approach to sound economy and rational policy than so doing must eventually prevail somewhere. The ideal solution of this problem would be the establishment of a separate school out in the country for the blind who are trainable but not educable. Such a plan should be simple in structure and program and could be operated economically. It is my hope that in the future some school will have the support and encouragement to make this venture, which would meet one of the great needs in the field of the blind today.

And yet in general we should rejoice, for present conditions mean that more and more cases of preventable blindness in childhood

are being stopped. Blindness is an affliction which only those who have experienced it can know through its consequences; and these are many and ofttimes appalling—how much so we who have always seen can guess but hardly comprehend.

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rather inane smile to practically any other type of grimace imaginable. When practiced continually over a long period of time, it becomes so ingrained as a habit that it will appear as an unconscious response to nearly every emotional excitation. Like any other problem of maladjustment this condition can be treated effectively only by attacking the situation which gives rise to it.

It may be observed that blind people who usually exhibit very satisfactory responses to ordinary social situations will, occasionally, display an expression of utter bewilderment, so complete as to give the face an appearance of absolute immobility. This should not be confused with expressionlessness, for it is the true expression of emotions experienced during a temporary disorientation. Some blind persons are practically never adequately oriented to their physical environment, while others become disoriented only when extraordinary circumstances arise which thwart the modalities upon which they happen to depend at the time for their contact with the significant points of reference in their environment.

Whether we refer to the ability of the blind to orient themselves in their physical environment as "a sixth sense" or "a sense of direction," we must realize that this ability is actually the result of the utilization of all the senses—either singly or in combinations, as the occasion may demand. The impressions of the contour and texture of the ground, walks, floors, etc., which may be gained through the soles of the feet, may give the blind person clues as to his position or the direction in which he is moving. The impressions of changes in pressure and temperature upon the face brought about by air currents or the interruption of air currents due to the presence of large objects nearby, may also help him to detect his position in relation to salient points in his environment. Posts, walls, breaks in the sidewalk and the like, will serve as significant points of reference about which the blind person can build in his imagination a picture of his environment as he knows it.

No impressions are more numerous or more important to the blind than those which are derived through the sense of hearing; and, with respect to orientation, these impressions are useful to the blind only to the degree to which they can be localized. It is probably safe to assume that auditory localization is subject to development through carefully directed exercise since there is some evidence to support the belief that the ability to localize sound is acquired largely through education in infancy and early childhood rather than by heredity. Unfortunately, very little is known in respect to the relationship between auditory localization and intelligence, or auditory localization and auditory acuity, or the extent to which auditory localization can be developed in children and adults who have not acquired it to any considerable degree during infancy and early childhood. Games, however, such as hunting crickets, locating a whistle, finding a bouncing ball, etc., have been profitably introduced into the educational and recreational programs of young children.

NOTE: This is the first of a series of articles planned by the writer upon various problems of practical importance in the education of blind children.

Kindergarten teachers should investigate the merits of "Bell-Ball," in which sponge balls are rolled through a wicket in an endeavor to ring a small bell, and they as well as others should be interested in "Symbolo" in which clear-cut designs take the place of spots on a set of dominoes. If these games cannot be found in local stores a catalogue may be obtained from The Embossing Company, Albany, N. Y.

Our Bookshelf

KATHRYN E. MAXFIELD, PH.D.

WHEN they are prepared with intelligence and accuracy annotated bibliographies are of great assistance to the educator and to his older students. Miss Helga Lende has made an outstanding contribution to all who are interested in the visually handicapped through her annotated bibliography, *Books About the Blind,* compiled under a grant from the Carnegie Corporation. (American Foundation for the Blind, New York, N. Y. 1940. 216 pages, $2.00.) The sections giving references on psychology, education, vocations, vocational training, and the preschool child are among those having special interest for school people. The value of the bibliography is increased by the fact that most of the reference material can be borrowed without charge, except for return postage, from the Foundation Library.

Mention of this bibliography brings to mind another annotated list of books published by the Foundation which, though limited in its purpose, is of importance to every teacher. Dr. Berthold Lowenfeld's *Learning by Listening*: *An Annotated, Classified, and Graded List of Talking Book Records for Use in Schools for the Blind,* is an outgrowth of the Foundation's Talking Book Education Project. (Inkprint edition, American Foundation for the Blind, New York, N. Y.; braille edition, American Printing House for the Blind, Louisville, Kentucky.) With this list on her desk the teacher can plan a constructive and vital incorporation of Talking Book material into her teaching program. References are arranged approximately according to educational level—high school, senior high school only, junior high school only, and the grades.

The publication of *Learning by Listening* reveals the fact that there is very little reading material available for children in grades below the sixth. One group of blind boys and girls for whose special disability adequate Talking Book material might help to compensate is that usually designated as backward. Often, because of their inadequate braille reading skill, and the limited amount of material within their vocabulary range, these pupils are kept from learning the many practical everyday facts which they are mentally capable of understanding. The right sort of Talking Book material could eliminate for them the drudgery of braille reading and at the same time give them a genuine appreciation of, and interest in, current events, the use of English, and the practical applications of science. Since the publication of *Learning by Listening* the American Printing House for the Blind, in cooperation with the Talking Book Education Project, has issued a considerable number of books for children in recorded form, including books that have been successfully used with children of lower reading ability. This material, selected on the basis of a thorough review of children's literature, takes into consideration the limited range of experience and vocabulary as well as the reading interests of such children. The twelve-year-old boy with a mental age of ten rarely has the same interests as the normal ten-year-old. He has had social experience during a longer period but he may be less keenly aware of what is happening.

Both educators and librarians are interested in knowing what are the reading tendencies of the adult blind, yet to date no adequate survey has been made. It is not necessary to know what *all* the blind like to read for the simple reason that not all of the blind care to read. However, it is highly desirable to know what the reading blind do read and do want made available to them either in braille or in Talking Book form.

A partial answer to this question is given in

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"What Can the Blind See in Our Factory?"

David H. Morgan, Ph.D.

Many of the units in general science classes touch upon various life activities. In order to make the material meaningful and to give the pupils wider contacts with the world in general, excursions have been made through representative factories, laboratories, and museums in neighboring cities. No difficulty is experienced in making the arrangements for the visitations until the fact is casually mentioned that the pupils are from a school for the blind. Invariably, the representative of the firm asks, "Well ....., what can the blind see in our factory?"

What can the blind see, for example, in an ice and cold storage plant? In a recent excursion through a large plant, we first went into the room where the two pumps for compressing the ammonia gas were located. Since our visit was during the winter, one of the pumps was idle. Therefore, we had the opportunity to examine it thoroughly. We saw how the wide, long belt, which connected the motor to the flywheel on the pump, ran under the floor on which we stood and also over our heads. We were really standing inside the belt. After having received permission, one of the boys tested the belt by climbing through the guard rails and standing on it. We examined the immense flywheel, which, although only one half of it was above the floor, towered above our heads. We were amazed at the size of the wheel necessary to keep the pump operating smoothly. We examined the piston of the pump (a greasy, but enjoyable, opportunity for some) and had its operations explained to us.

After examining the motor and the switchboard, we went over to the operating pump and learned more about its function. We felt the water in the cooling system and were surprised to find it a little too warm for comfort. Several of us stood inside the moving belt and, by extending our arms above our heads, could touch the belt as it went by. Although only one pump was operating, the noise was so great that we were relieved when we left this room.

In the next section of the plant we did not see much, simply because there was not much to see. We heard how the water was purified before being sent up to the top floor of the building where the ice is made. The statistics (which we immediately forgot) regarding the quantity of water and of chemicals used impressed upon us the immensity of the business.

After climbing several flights of almost perpendicular stairs, we arrived in the room where the ice is made. Here, we saw everything that there was to see. We saw how the water, while it is being frozen, is kept constantly in motion by air which is forced down a hose to the bottom of the container. An examination of a partially frozen cake of ice disclosed the fact that water freezes on the outside before it freezes in the middle. The crane for lifting four of the cans, each containing approximately 330 pounds of ice, was examined before and during operation. The process of separating the ice from the cans by lowering them into a tank of water and then tilting them so that the ice slid out of the can was readily followed. We saw two cakes of ice started on their journey down to the ground floor. We then examined the holes in which the tins containing the ice had been and readily understood from the coldness of the brine why the water had frozen.

After we had returned downstairs, the other two cakes of ice arrived, and we watched while they went through a machine which marked them into equal segments for future cutting. We examined the finely powdered ice resulting from the scoring of the blocks and (much to the discomfort of some members of the class) discovered what wonderful

snowballs it made. We were told the number of tons of ice stored in that room and, as we shivered, had no inclination to dispute the figure.

The next part of the trip took us through the different cold-storage rooms. In one of the rooms (19° below zero) we examined several boards which turned out to be ducks and turkeys. As we went from room to room, we noticed the changes in temperature and learned that various foods require different temperatures. We were amazed to learn the quantities and the types of foods which are kept fresh in cold storage. We sampled some of the edible foods and found that they were quite tasteless at such a low temperature.

After the trip through the plant was over, the representative of the firm, who had asked the usual question, said, "I believe that this group has seen more than any other group which has gone through this plant." We, in turn, agreed that we had "seen" more in this plant than in any other. We had received impressions through the receptors for touch, hearing, smell, taste, and, in a few cases, vision.

What can the blind see in an observatory? Our first excursion to the observatory of the University of California was made this year by the seventh grade science class. In this case even the teacher was skeptical regarding the value of such an excursion. However, the trip was an unqualified success. We saw the sextant and learned its purpose. The revolving drum on which the observations are timed was carefully examined. Then we saw the telescope! Not all of us could see the entire apparatus, but we did obtain an impression of what it was like. We were also intrigued by the revolving dome on the building, and all of us assisted in turning it. The moon being full, a few of us managed to see it through the telescope. Two of our number could even see Saturn, and, from their enthusiastic description, the others felt almost as though they had seen it themselves. Needless to say, this excursion, like all the others, remains on the list for the next year.

We have only begun to realize the possibilities for excursions in our neighborhood. Each year several new plants are visited, and several excursions for future classes are added to our list. The following places, in addition to the two mentioned above, have received a unanimous vote for our approved list: the "atom buster" (cyclotron) at the University of California and the adjoining laboratory in which are kept the white mice for experimental treatment with the substances which have been made radio-active by the cyclotron, the paleontology and the biology museums at the University of California, the telephone company, a creamery, a cannery, the weather bureau, the identification bureau of the police department, and a museum in San Francisco, one room of which is devoted to exhibits for the blind.

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that a minimum of adaptation was more desirable.

The general organization of physics courses in the residential schools was found to be similar to that followed in public high schools. A minimum of forty minutes is allowed for class recitations, while laboratory periods range from sixty to ninety minutes. The appended remarks and comments of the instructors proved to be an illuminating part of the study. As a result it was considered advisable to include this material with the discussion of the nature of adaption which will be presented in a future issue of THE TEACHERS FORUM.

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learning by insight is regarded as the essential factor. The school of Gestalt psychology refuses to accept a perception as a sum of sensations or to believe in an analysis of psychological phenomena into their elements. The perception itself can only be understood as a totality, as a unified whole, as a "Gestalt." It is more than the sum of its parts and is determined by the totality of the stimulating conditions. "Gestalt psychology attempts to get back to naive perception, to immediate experience 'undebauched by learning'; and

it insists that it finds there not assemblages of elements, but unified wholes; not masses of sensations, but trees, clouds, and sky. And this assertion it invites any one to verify simply by opening his eyes and looking at the world about him in his ordinary everyday way."[5]

Teaching based on such principles will be greatly aided by educational Talking Book records and will stimulate such experiential activities as the use of teaching models, the field trip, modeling, and other types of pupil projects. Thus, the new reading practices originated by the use of the Talking Book will not only ameliorate the difficulties incident to slow reading but also give new impulses to the application of progressive methods in teaching.

[5] Heidbreder, Edna. *Seven Psychologies*. D. Appleton-Century Co., Inc. New York, 1933, page 331.

(*Continued from page 37*)

an article by Mrs. Margaret Riddell, "A Survey of the Reading Interests of the Blind," in the *Library Journal*. (Vol. 65, 1940, pp. 189-192.) A questionnaire was sent to 2,419 subscribers to the braille edition of *The Reader's Digest* by the American Printing House for the Blind, an organization which naturally has a direct interest in the subject. Of this number, 1,262 returned their questionnaires, and 1,250 replies, or 51 per cent of the total were sufficiently complete and legible to be used in the study. The author realizes that this survey gives a sampling of a better-than-average group and she urges that a more extensive investigation be made. However, certain points do stand out which may have wider application. In summarizing the general trends revealed by the study the author says:

"These people are chiefly interested in reading stories based on fact, such as we find in the books of readable non-fiction (to use a librarian's phrase) or stories of romance and adventure of a purely imaginary type. They are interested in books of current interest and in books on current topics. They are interested in themselves and in how to improve their relationship to the world in which they live." They want good, but not "highbrow" reading material.

In the article "The Future of Piano Tuning in Schools for the Blind" in the May issue of the TEACHERS FORUM, the last sentence on page 88 is misleading and the following should be substituted: "A course of this kind should most assuredly include training in public speaking and salesmanship, preferably in a high school or college. Such a program could, no doubt, be well organized in several of the schools for the blind which already have some of the necessary facilities."

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for
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Mental Measurements of the Blind: History, Inventory, Criticism

Samuel P. Hayes, Ph.D.

It is a surprise to many people to learn that there is any need for the application of mental measurements to blind children, and it is equally a matter of surprise that such measurements can be and have been made. In schools for the blind where small classes, full daily programs and the intimacy of social relations in dormitories offer unusual opportunities for teachers to become well acquainted with their pupils, one might assume that mental measurements would be superfluous; in fact this position is still held in some schools. But where teachers' judgments and standard measurements have been compared we find the same striking differences of opinion which have motivated the almost universal use of tests in schools for the seeing, and in grades which have been determined on the basis of teacher judgments alone enormous differences in ability are disclosed by tests. In such grades we are pretty sure to find children who simply cannot do the work, but have been retained by kindly and over-sympathetic teachers; and we often find children denied promotion because a teacher does not approve of their attitudes, because their work has been "spotty," or because they have not fulfilled her demands in all details, when standard tests show that they are ready for the next grade and may be seriously injured by repeating a whole year's work with little sense of achievement.

In some schools for the blind standard tests have now been used for nearly twenty-five years, and the test movement is rapidly extending to many others. The first adaptation of intelligence tests was attempted by R. B. Irwin and H. H. Goddard* in 1914; the use of achievement tests was begun by S. P. Hayes in 1917. The primary object of both types of tests is to assist in the educational process, but certain distinctions should be made between them. The chief aim of intelligence tests is to determine the native capacity of children so that they may be scientifically classified in groups of similar ability, those who have very little ability may be segregated in special classes, and those with superior ability may be encouraged to attempt a more comprehensive and enriched course of study. Incidentally intelligence tests may suggest to the teacher plausible explanations of poor work or restlessness and give valuable hints for vocational guidance. Achievement tests are designed to show how well the children are doing their school work, and when compared with intelligence tests of the same children, serve to indicate whether the children are making reasonable use of their native abilities. Achievement tests are standardized by applying them to large numbers of pupils in different parts of the country, following explicitly the instructions for administering them. They therefore provide standards or norms with which to compare any individual, grade or school; and when given in successive years they measure progress and become valuable aids in the promotion and reclassification of pupils. In their latest development, as diagnostic tests, they facilitate the analysis of school subjects into their elements, thus showing the teacher which parts of a subject need special emphasis for individuals or a grade as a whole; and they may prove the need for changes in the time allotted to certain subjects or parts of subjects. Incidentally all achievement tests may become motivating devices since they arouse the interest of teachers, pupils, and

* All of the books and articles referred to in this paper may be found in the appendices to the writer's new book about to be published by the American Foundation for the Blind.

parents. If a child of good native ability tests repeatedly well below average in a series of achievement tests, it is hard for him to find alibis, and the teacher is protected from the criticism of parents who cannot understand why their child is obliged to do so much home work.

A. Achievement Tests in Schools for the Blind

The first standard achievement test to be put into braille was a simple reading test. Reading seemed a natural subject for the first attempts at measurement because so large a part of school work depends upon facility and accuracy in handling braille; and the attainment of reasonable proficiency in reading during school days is fundamentally important for any adult who hopes to keep in touch with the world of people and events. The test selected was easily adapted for the blind and its use brought to our attention various facts which have been very important in our tests in other school subjects. Aside from the fact that it proved the possibility of using with blind children standard tests constructed for the seeing, it brought to light great differences in reading rate and in comprehension within grades and in groups selected according to years of school experience and mentality. It also showed that in general blind children read only about one third as fast as seeing children—a fact which has been of the greatest importance in the adaptation of all timed tests which must be given in braille. Other conclusions derived from this experiment were that one could not expect blind pupils below the fourth grade to be far enough advanced in reading to take group tests in braille; that standard tests might be expected to show wide individual variations in ability but little sex difference; that late entrance into schools for the blind and the slowness of braille reading might be expected to cause an age-grade retardation of two or more years; that comprehension in reading is correlated positively with general intelligence.

After this preliminary trial with reading, standard tests in other school subjects were adapted and, at the request of the Efficiency Committee of the A.A.I.B., used in a survey of eight to ten schools by trained testers from the Pennsylvania Institution for the Instruction of the Blind and the Perkins Institution. In 1921 the writer published his manual, "Self-Surveys in Schools for the Blind," giving explicit directions for tests in arithmetic, American history, English composition, English vocabulary, verbal ingenuity, sentence completion, word completion, geography, grammatical usage, silent reading, spelling, and rate of reading, along with two group intelligence tests. To quote from the introduction: "The tests described in this manual have been carefully adapted to the blind, used in from 8-10 schools upon about 450 pupils from the fourth grade upwards (by 1925 the tests had been used in ten schools upon more than 600 pupils and tentative norms published), and revised to meet the friendly criticisms of the teachers who have seen them in operation. We believe that anyone who is intelligent enough to teach school, and who is sufficiently interested to study and follow the directions explicitly, can give these tests with a degree of exactness that will suffice for the usual problems of classification." Apparently we were somewhat ahead of the times for very little use seems to have been made of these tests except in the schools where our specially trained testers lived or visited. When the original issue of the manual was exhausted, a new edition was considered but in view of the uncertainty of the response from teachers it was decided to bring out new tests from time to time in monograph form at the American Foundation for the Blind and later as articles in the Teachers Forum, started in 1928.

The second decade of achievement testing in schools for the blind witnessed a slow but steady increase in interest. In 1927 Kathryn E. Maxfield published her "Adaptation of Educational Tests for Use with Blind Pupils" in which directions were given for administering the reading and spelling tests of the 1927 Stanford Achievement series and Gray's

Oral Reading Check Tests; in 1927 the Experimental School was established at Perkins Institution in cooperation with the American Foundation, providing a laboratory for testing the tests; in 1928 Dr. Maxfield published "The Blind Child and His Reading" and started the publication of the TEACHERS FORUM FOR INSTRUCTORS OF BLIND CHILDREN, opening its pages to descriptions of new tests and reports of their results; in 1929 Miss Lende, Librarian of the Foundation, started her reading lists with a bibliography of educational and mental test references. Just how many teachers began testing during this decade we do not know but a report of extensive testing at the California school was presented by Anita M. Mühl at the convention of the A.A.I.B. held in California in 1930, and several new names appeared in connection with articles about tests in the TEACHERS FORUM, Mrs. Thomas giving directions for the use of the Monroe Standardized Silent Reading Tests, R. D. Merry and Marion Kappes writing about the use of music tests and B. F. Holland reporting upon his experiments with braille reading and giving directions for the use of standardized tests for Spanish. During the same period the writer published three articles upon tests in the TEACHERS FORUM, and presented a general review of his twenty years of research in schools for the blind at the Raleigh convention of the A.A.I.B., in 1936.

Our third decade of achievement testing, beginning in 1937, bids fair to be an era of flowering, marked first by the widespread use of a comprehensive series of tests arranged by the writer, and by the independent adaptation and use of various special tests by teachers and principals. After satisfactory preliminary trials of the former—the New Stanford Achievement Tests, third revision—the writer, in cooperation with testers in three eastern schools published detailed instructions for giving the whole series of tests: paragraph meaning, word meaning, spelling, language usage, literature, history and civics, geography, arithmetical reasoning and computation. Paragraph meaning is tested by asking the children to read a paragraph and supply a missing word intended to show whether or not they have understood it. For example, "Dick and Tom were playing ball in the field. Dick was throwing the ball and ..... was trying to catch it." Word meaning was tested by asking the children to select the one out of five given words which best completes a sentence. For example, "A rose is a *box flower home month river.*" Spelling is tested by dictating a series of sentences containing simple words for the lower grades, and progressively more difficult words for the higher grades. Language usage is tested by asking the children to decide which of two sentences is better. For example, "Apples *is* good." "Apples *are* good." Knowledge of literature is tested by asking the children to select from three alternatives the best word to complete a sentence. For example, "Little Red Riding Hood took cakes to her *aunt cousin grandmother.*" The best answer technique is used also for testing history and civics. For example, "The Pilgrims came from *England France Spain.*" The same formula is used for testing geography. For example, "A state having no seacoast is *Maryland Idaho South Carolina.*" To test physiology and hygiene also three alternative answers are offered. For example, "The body is covered by *muscles bones skin.*" In testing arithmetical reasoning ordinary problems are used such as, "Charles has 6 brown rabbits and 5 white ones. How many rabbits has he?" Of course in all the tests, simple items are given at first to encourage the younger pupils; then the items become progressively more difficult, the later ones demanding years of schooling. The tests of arithmetical computation begin with simple exercises in addition, subtraction, etc., and rise to advanced problems in decimals, columns, areas and unknown quantities.

The Stanford Achievement Tests are issued in five equivalent forms which have been put into braille and made readily accessible to schools on quota from the American Printing House for the Blind. In at least one school all

five forms of the test have been used, and at least a dozen schools have reported upon one or more testings, furnishing material for a series of articles by the writer which have been published in the Teachers Forum. A further revision of these tests has been announced by the publishers, the World Book Company, which will be adapted for use with the blind as soon as possible after they are available.

These tests have given the teachers reliable pictures of their pupils' work, and where they have been repeated year after year, they have yielded illuminating curves showing the progress of individuals, grades and schools in most of the subjects taught in the elementary grades. In schools in which the children have been properly classified the curves based upon grade averages have shown the blind to be just about at the seeing levels, thus proving the possibility of normal educational progress by the blind and the feasibility of testing their progress with standard tools of measurement. Of course curves by chronological or mental age show the expected two or more years retardation, but this is inevitable since the achievement tests have a positive correlation of more than .80 with our adaptation of the Binet intelligence tests. Also these tests demonstrate the ability of blind children to adapt themselves to strange new ways of testing—they readily adjust themselves to the use of a short pencil to mark the amount of work they have done on the braille test when time is called, they quickly learn to deal with material put in best-answer, word-completion or true-false form. On the other hand they have a good deal of difficulty with matching tests since this technique involves quite a tax on the memory or very frequent rereadings. The ordinary arrangement, in this method of testing, is to print two parallel columns, one column consisting of a list of words or names and a second column consisting of items to be associated with them. The seeing pupil can readily look up and down the lists until he finds the items that match: for the blind it is a much slower process because he must read the whole of both lists and then either memorize one or go over it repeatedly, wasting time and probably making mistakes. So it has been our custom to transform ink print matching tests into some other form, retaining the original content. It is also frequently a wise course to give a certain proportion of our test material orally: this saves much reading time and accords with the common emphasis upon oral teaching in schools for the blind.

To meet the demand for information as to what tests have been put into braille and therefore might be feasible for administration by interested teachers, we have listed below all the achievement tests adapted for use with the blind in recent years. Listing, however, does not imply recommendation. The writer has had no opportunity to observe the use of most of the tests in Sections II and III, but since the braille for most of these tests is accessible on quota at the American Printing House, he hopes that many teachers will put it to use and give him a critical report of their findings. The American Printing House will give information concerning the grade of braille used, the number of pages in each test pamphlet and the school grades for which the tests are suitable. In the writer's article, "Practical Hints for Testers" (The Teachers Forum, 1939, 11, 82-93), may be found various pointers in regard to these tests with references to articles which have been written about them.

1. Achievement Tests for Elementary School Children

a. Tests in a single subject

Sangren Information Test for Young Children (Oral, no braille)

Gray Oral Reading Check Tests (Oral, no braille)

Monroe Silent Reading Tests—Forms 1, 2, 3

Iowa Silent Reading Tests: elementary—Form B.

Pressey Test of Practical Information

Otis Classification Test—Form A, part 2 (Oral, no braille)

Hahn-Lackey Standardized Test of Geographical Information
Courtis Map Test
Michaelsohn American History Tests (Oral, no braille)
Wisconsin Inventory Tests in Arithmetic
Stevenson Arithmetic Reading Test I, Form 2
Wilson Language Error Test I
Mitchell Testbook for Caldwell and Curtis "Introduction to Science"

b. Test series covering most of the school subjects

New Stanford Achievement Tests: advanced examination—Forms V, W, X, Y, Z
Unit Scale of Attainment: Division 2, Form A
Standard Graduation Examination—Form A (Partly oral)

II. Achievement Tests for High School Pupils

American Council Alpha Spanish Test—Form A, parts I and II
Cooperative French Test—Form 1936
Cooperative French Test: revised series, advanced—Form P
Cooperative Latin Test: revised series, elementary—Form O
Cooperative Latin Test: revised series, advanced—Form P
Cooperative Plane Geometry Test: revised series—Form O
Cooperative Algebra Test: revised series—Form P
Mitchell Objective Tests for Dodge's New Biology
Sones-Harry High School Achievement Tests—Forms A and B. (A series of tests in high school subjects.)
Scholastic Aptitude Tests of the College Entrance Examination Board. (Given only under the auspices of the Board.)

A fairly comprehensive measurement of a whole school may be obtained by the use of (a) the New Stanford Achievement Tests in grades 4-9, (b) the Standard Graduation Examination in the eighth grade at the end of the year to test fitness to enter high school, and (c) the Sones-Harry High School Achievement Tests in the high school. Pupils who plan to go on to college may apply to the College Entrance Examination Board which now offers its tests in braille. Teachers who have the time and interest to do further testing may well use any of the other tests listed or adapt still others for their special needs, following the suggestions given in "Practical Hints for Testers." Many tests may be given with little change by presenting the material orally, a method which has been extensively used in our adaptation of the Standard Graduation Examination.

III. Diagnostic Tests and Remedial Exercises

A modification of achievement testing which makes an especial appeal to teachers is the so-called "diagnostic test" which may point the way to remedial work with individuals. Of course, any of the standard tests may yield data of diagnostic value through studies of the types of errors made. But the specially constructed diagnostic test seeks to assist the teacher in putting her finger directly upon the process, element or factor in a school subject which is causing particular difficulty for the individual pupil. An account of the use of diagnostic tests at the New York Institute for the Education of the Blind may be found in Chapter 27 of *Education of the Blind,* (New York: World Book Company, 1940, p. 436)

Wrenn Stanford Study Habits Inventory (No braille)
Gates-Russell Diagnostic Spelling Test (Oral)
Ayres' List of One Thousand Most Frequently Used Words
Schorling-Clark-Potter Arithmetic Tests
Schorling-Clark-Potter Instructional Tests in Arithmetic for Pupils of Varying Abilities
Rinsland-Beck Natural Test of English Usage
Pressey Diagnostic Tests in English Composition
McCall-Crabbs Diagnostic Reading Manuals
Regents' Examinations in Reading
Gates-Peardon Remedial Reading Books (Oral, no braille)

Strang Study Types of Reading Exercises (Oral, no braille)
Durrell Remedial Reading Exercises
Tests in Everyday Reading (American Education Press)

B. Intelligence Tests in Schools for the Blind

The Binet-Simon intelligence tests had been in use in America for only a few years when their value for the classification of blind children was recognized by R. B. Irwin, then Supervisor of the Department for the Blind in the Cleveland public schools. In the summer of 1914 he visited H. H. Goddard, at Vineland, N. J., to discuss the question of adapting these tests for use with children without vision. Taking Goddard's translation of the 1911 edition of the Binet scale as a basis, they struck out those tests which could not be given without the aid of vision, made additions from various sources, and arranged their whole collection of tests in year groups according to Irwin's judgment of the abilities of blind children. The tests were at once put to use in the Ohio State School for the Blind by T. H. Haines who recast them in point scale form, publishing his results with directions for the use of the tests in "Mental Measurements of the Blind: A Provisional Point Scale and Data for a Year Scale," *Psy. Mon.,* 1916, 21, No. 1, whole No. 89. Soon afterward W. B. Drummond tried out the tests with 133 children in various schools for the blind in England and Scotland and published his "A Provisional Point Scale for the Blind" in the *Edinburgh Medical Journal,* 1920, 24, pp. 232-247, 307-323. In Germany, K. Bürklen made an independent adaptation of tests for blind children, depending largely upon Bobertag's use of the Binet tests, publishing his results in the *Zeitschrift für das österreichische Blindenwesen,* 1918, 5, pp. 959-965 and 1921, 8, pp. 1438-1440.

Group intelligence tests have also been used occasionally in schools for the blind, and since they can be administered by teachers they furnish a convenient survey of the more general abilities of the pupils in a grade to compare with their achievements in the subjects they are studying. Directions for giving the Pressey Group Point Scale and the Pressey Cross Out Tests were published in the writer's manual for self-surveys in 1921, directions for the Otis Classification Test appeared in the Teachers Forum in 1931 and directions for the Sangren Information Tests for Young Children and the Kuhlmann-Anderson Group Intelligence Test in the Teachers Forum in 1938 and 1939. All these tests show fairly satisfactory correlations with the individual tests which take much more testing time and have to be given by trained testers, and thus serve as a secondary source of information upon the intelligence of blind children.

Systematic routine testing was started in two American schools for the blind in 1916 and within a few years more than 1100 blind children in ten residential schools had been individually tested. In 1916 the Stanford revision of the Binet tests was published and soon became the standard method of measuring the intelligence of seeing children. Realizing the advantage of bringing our tests into harmony with those for the seeing, the writer prepared and distributed in 1923 his "Scissors and Paste Guide," an instruction book made by pasting into the Terman Guide a number of typed slips covering such changes as seemed necessary to adapt the tests for use with the blind. The arrangement of tests was based upon a careful, though incomplete, statistical study of passes and failures by age groups, supplemented by the judgment of the psychometrists who had used the tests continuously since 1916. Irwin had very early realized that some of his tests were unsuitable and that others were probably placed in the wrong year groups; Haines and Drummond had both been much impressed with the importance of degree of vision and the probable differences in mental imagery according to the age at onset of blindness, and had based their arrangements of the tests upon the results of the comparatively small number of pupils who had been totally blind from birth

or early infancy. The writer was inclined to stress the practical need for a scale which would measure all of the children who came to schools for the blind, as well as the advantage of comparing them with seeing children of the same ages. His experience had led him to minimize the importance of the age at onset and the degree of blindness.

The 1923 Guide was widely distributed and seems to have served its purpose fairly well. But too little acceptable material was then at hand to provide six tests for each of the year groups, and quite a number of tests had been put into year groups later than those in which Terman had located them for use with the seeing, in order to get a scale which would yield a normal distribution of intelligence quotients among the blind. To obtain additional material, various other test series were examined, and a considerable number of items which seemed feasible for use with the blind were assembled and tried out with 418 pupils in residential schools. By the end of 1929, 746 more children had been tested with the 1923 Guide and it seemed wise to make a third revision. With the new material accumulated it was then possible to give a full complement of six tests in each year group with some alternates, and the study of passes and failures justified an age grouping of tests much closer to Terman's. Also it seemed time to print a more convenient book than the "Scissors and Paste Guide" of 1923.

The distribution of the 1930 Guide resulted in a much wider use of intelligence tests with the blind, for not only was a program of regular testing and retesting started in a considerable number of residential schools, but many clinics and institutions for mental defectives, as well as braille and sight-saving classes in the public schools now made regular use of our Binet adaptation. In general both the 1923 and the 1930 adaptations produced fairly normal distribution curves when total unselected school populations were tested, and retests after two or more years showed a reasonable constancy of the I.Q. We had looked forward to obtaining an average I.Q. of 100 in each school tested with the 1930 adaptation; actually the average I.Q.'s in sixteen different schools reporting from 1930 to date ranged from 108 to 92. Whether this means that some schools draw their pupils from better intellectual stock than others, or indicates local differences in the reception and retention of pupils in residential schools, or points to inequalities in leniency of scoring by testers of different training, we cannot at present determine. An extended study of the pupils entering two large eastern schools, where the directors have exercised a fairly liberal policy towards pupils of modest intellectual promise, has discovered little change in the average I.Q. during the period from 1915 to 1940, using our three adaptations of the Binet tests successively. In these two schools the median I.Q. curve oscillates from year to year slightly above or below I.Q. 90 as a center. For our whole group of 16 schools, involving tests of 2192 pupils with the 1930 adaptation the average I.Q. was 98.25, S.D., 1970.

The two commonest criticisms of our adaptations of the Binet tests have been: (1) that no thorough-going standardization of the tests for the blind has ever been published and (2) that nobody knows just what value to give to the resulting I.Q., i.e., how it compares with an I.Q. obtained from Binet tests of seeing subjects. We are now attempting to correct both deficiencies in our fourth revision, the 1940 adaptation.

1. Steps in the adaptation and standardization of a Binet series for the blind.

The 1914 adaptation was a common-sense modification of the 1905, 1908 and 1911 Binet-Simon series, in which Irwin and Goddard simply omitted the tests which could not be taken without vision, introduced a few new tests which looked promising, extended the use of certain tests into additional year groups and moved some tests into year groups where they seemed more suitable on the basis of Goddard's experience in testing and Irwin's knowledge of the blind.

The 1923 "Scissors and Paste" adaptation

was based upon a study of passes and failures in nearly 1200 tests, checked by comments of the psychometrists who had used the tests in various residential schools for the blind. When work was begun upon the 1930 adaptation we had data from an additional 1600 tests, and comparisons were made with Terman's 1916 figures and our 1923 figures. Charted by per cent passing in each age group we get a picture in which the two curves for the blind follow a course similar to that for the seeing, but at least 10% below it. A similar curve based upon 2234 tests with the 1930 adaptation showed only about a 5% deficiency; but while the average per cent passing by age groups was fairly satisfactory, the curve of per cent passing in the individual test items was still quite irregular. In general the 1930 adaptation seemed to work fairly well in the classification of pupils, but there were many surprises in the I.Q.'s attained by certain individuals and in the changes in I.Q. noted upon retesting.

The 1940 adaptation, now nearly completed, will consist of an attempt to answer the following questions: (a) Has the 1930 adaptation been a fairly *valid* instrument which is worth working over and revising again? In general we feel that our answer must be an affirmative one, because of the relatively high positive correlations obtained with other measures of intellectual achievement, as well as the general approval of the tests by teachers and testers. The Otis Classification Test—Form A, part 1, gave rank order correlations with M.A. obtained with the 1923 adaptation of + .76 for 210 pupils in the Perkins Institution and the Pennsylvania Institution for the Blind, and + .77 for sixty-four pupils in the Western Pennsylvania School for the Blind. The Stanford Achievement Test yielded product moment correlations of + .75, + .83, + .83, and + .95 in four schools with from sixty-nine to 103 pupils. The Kuhlmann-Anderson Group Intelligence Test gave somewhat lower product moment correlations (+ .56, + .57, and + .69) in three schools with from thirty to 102 pupils. There is, however, some question as to whether the mechanical difficulties of this test when given in braille have been satisfactorily overcome and whether it is not as much a measure of facility in tactual reading as a measure of intelligence. (b) Has the 1930 adaptation been fairly *reliable?* The evidence from retesting seems to justify an affirmative answer to this question also. (1) For the *test as a whole* we find a rank order correlation by I.Q.'s of + .95 for seventeen pupils retested at the Perkins Institution after six months; a product moment correlation of + .87 for 130 pupils retested at the N. Y. State School after four months; a product moment correlation of + .85 for fifty-three pupils retested at the Pennsylvania Institution after from one to twelve months, of + .79 for forty-nine pupils retested at the same school after from thirteen to twenty-four months, and similar results for later retestings; product moment correlations of + .79 for 409 pupils at the Perkins Institution and + .85 for 587 pupils at the Pennsylvania Institution when their first and second tests are correlated regardless of the time interval between tests. (2) When the *individual test items* are correlated on retesting we find that at the New York State School, twenty-six of the fifty-six tests used showed retest correlations of + .90 or above, while only eight of the tests showed correlations below + .60; at the Perkins Institution, on retesting within twenty-four months, none of the fifty-seven tests used showed retest correlations of + .90 or above, thirty-eight tests showed correlations of + .60 or above and eighteen tests showed correlations below + .60; at the Pennsylvania Institution on retesting within twenty-four months twenty-six tests showed correlations of + .90 or above, thirty-eight showed correlations of + .60 or above and seventeen tests showed correlations below + .60. Apparently a large per cent of the tests are reliable; some will have to be modified or dropped. (3) A further measure of reliability was obtained through the calculation of tetrachoric correlations of each test item with the M.A. obtained from the whole battery of

tests, in seven schools. In general these correlations run high enough to be quite satisfactory. Only a few tests will have to be omitted as a result of this check-up. For five of the seventy-six tests studied, correlations of + .90 or above were obtained, for sixty-seven of the seventy-six tests, correlations ran from + .60 up, and for only twelve were the correlations below + .60. Tetrachoric *intertest* correlations within each year group were also calculated to find whether there were any test items which unnecessarily duplicated each other by apparently measuring the same factors. In each year group these correlations showed a wide range—from + .18 to + .66 in the sixth year tests, for instance. The average of the whole collection of intertest correlations was + .51. The relatively small number of tests showing intertest correlations in the 80's and 90's will naturally be omitted in our revision: they are mainly concerned with tests in which fine distinctions in the meaning of words are demanded. (4) As a measure of the *constancy of the I.Q.,* sixty-eight pupils at the Perkins Institution who had been tested five or more times were selected for special study. These pupils were first divided into five ability groups on the basis of their average I.Q.'s at different periods of testing, 70-79 I.Q. being classed as *very low,* 80-89 classed as *dull,* 90-109 classed as *average,* 110-119 classed as *superior,* 120 and above classed as *very superior*. All the curves for the individuals of each group were assembled on a single sheet and I.Q.'s interpolated for the years in which they were not tested; then "limited range" curves were made by combining the individuals who were tested through the same span of years. The 100 I.Q. line was drawn in for comparison. Surprisingly consistent limited range curves resulted. The *very low* group, for instance, involving ten individuals, furnished four curves all of which followed practically the same course, starting with about two years retardation at C.A. 7 and gradually bending over to three years retardation at C.A. 10, and five years retardation at C.A. 16. The *dull* group, consisting of fourteen individuals, yielded four limited range curves which run along close together, starting with a retardation of less than a year at C.A. 6, bending slightly for a retardation of nearly two years at C.A. 12, and four years retardation at C.A. 16. The *average* group, composed of twenty-three individuals, yielded six limited range curves which clustered about the 100 I.Q. curve through the early years, with a tendency for two of the curves to rise above the normal curve from C.A. 13 onward. The *superior* group, consisting of thirteen individuals, yielded three curves which showed a consistent acceleration, starting at about one year at C.A. 7 and attaining two or more years acceleration in the early 'teens. The *very superior* group, consisting of eight individuals, yielded three curves with similar progressive acceleration from a two years' superiority at C.A. 7 to a four years' superiority at C.A. 14 and then somewhat less. In general these curves seem to indicate a very satisfactory constancy of the I.Q.; the normal group remains normal throughout its course; the superior groups tend to show greater superiority and the inferior groups greater inferiority as we advance from the lower to the higher C.A.'s. These results seem particularly gratifying considering the variety of factors which might affect the accuracy of the individual I.Q.'s—that through the years different testers were employed who had different training and might show variations in severity or leniency of scoring, that the tests were given at irregular intervals and interpolations made necessary, that only a limited number of cases was available so that chance factors like differences in the effect of the handicap of blindness and differences in the environment before and after blindness might have a large and unpredictable influence on the results. A further proof of the constancy of the I.Q. may be obtained from the fact that the critical ratios —obtained by dividing the difference of the means by the sigma of the difference—run quite low, i.e., in fifteen critical ratios calculated from the retest data only two are high enough to show a significant difference be-

tween test and retest, the other thirteen ratios all being below 3 and many of them much below 3.

2. How intelligent are the blind? How does a Hayes-Binet I.Q. compare with a Stanford-Binet I.Q.?

Great caution must be used in generalizing about the intelligence of the blind since determining this has not been a major aim in our work. We needed tests to classify children coming to schools for the blind and the practical issue had to take precedence over the theoretical. We have now, however, a certain amount of indirect evidence which will be checked with direct evidence when material accumulates from the projected use of the L and M scales of the Terman-Merrill revision, selecting only those tests which can be used with the blind practically without change, and in the same year groups in which they are scored for the seeing. Other evidence will come from the use of the Brown I.J.R. Test for the Visually Handicapped and the Wechsler-Bellevue Adult Intelligence Tests, both series having been standardized on the seeing.

In so far as the Binet tests measure functions similar to those involved in school work, one might reasonably expect somewhat lower I.Q.'s than with the seeing, since blindness accentuates various well-known causes for school retardation. We are accustomed to explain educational retardation by any one of a considerable number of accidental causes such as illness in infancy, physical accidents, malnutrition, lack of sleep, unwise treatment in the home whether characterized by overindulgence or excessive restraint, emotional conflicts due to a sense of inferiority or an unhappy home life, belated admission to school, irregular attendance, inefficient teaching, etc. Whenever blindness increases such hazards—and people in work for the blind will say that this occurs very frequently—we may look for their effects in delayed development and backwardness in school work. As a matter of fact we do find an age-grade retardation averaging from two to three years in most residential schools for the blind, and extending to four years or more in some schools or grades.

Our indirect evidence points to a similar retardation in the development of intelligence. (1) In our achievement tests, which show a high correlation with our Binet tests, blind children who average two or three years over-age for their grades, test just about at the seeing levels when we give them the extra time needed for reading braille. (2) A comparison of the I.Q.'s obtained when 300 pupils tested with the 1923 adaptation were scored in two ways, indicated a lower attainment for the blind. In this study two I.Q.'s were calculated for each individual, one I.Q. from the test items in the age groups in which they appear in the 1916 Stanford-Binet, which we called the "seeing I.Q.," and another I.Q. calculated from the same test items but in the changed age groups in which they appear in the 1923 adaptation for the blind, which we called the "blind I.Q." The average "seeing I.Q." was + .89 S.D., 1821; the average "blind I.Q." was + .92 S.D., 1910. The two I.Q.'s showed a rank order correlation of + .84 ± .011. (3) Various tests of blind children's vocabularies point to a marked retardation. Terman's group vocabulary test was used with more than 400 blind children in our early testing and showed a definite annually increasing retardation of one year for the eleven-year-olds, three years for the thirteen-year-olds and four years for the sixteen-year-olds. The individual vocabulary test of the Binet series showed a similar retardation. Terman, in his 1937 revision, states that his vocabulary test "agrees to a high degree with the mental age rating on the scale as a whole;" so we may conclude that the deficiency which blind children show in vocabulary gives further evidence of a low level of intelligence. Similarly in the Word Meaning test, which is number two of the Stanford Achievement series, the attainment of blind children runs about ten per cent below seeing standards when the blind are grouped by mental age. (4) Blind children tend to test lower than the seeing in all the Binet items which one would classify under thinking or

reasoning. In the comprehension tests and in the tests calling for differences and similarities we find an increasing retardation, one or two years in the lower age groups and four years in the 'teens. Samples of comprehension tests are: "What must you do when you are sleepy?" at four years; "What's the thing to do if it is raining when you are out playing?" at six years; "What's the thing for you to do when you have broken something which belongs to someone else?" at eight years; and "What ought you to say when someone asks your opinion about a person you don't know very well?" at twelve years. "What is the difference between an orange and a ball?" is asked of the seven-year-old; "In what way are iron and silver alike?" is a ten-year test; "In what way are a snake, a cow and a sparrow alike?" is asked of the twelve-year-old. Blind children test just about at age when eight-year-olds are asked to make a sentence containing two words, such as *ball* and *play;* they fall two years behind when at ten years they are asked to make a sentence containing three words such as *work, money, men*. Still more obvious thought questions are the following: The problematic situations presented to nine-year-olds, such as, "A little boy is coming into his home crying, and holding a paper bag with a hole in it. What has happened?"—the absurdities tests of the twelve-year group such as, "An engineer said that the more cars he had on his train, the faster he could go. What is foolish about that?"—such fourteen-year tests as the interpretation of fables, the completion of analogies, such as, "Ship is to water as train is to what?"—the problem questions, such as, "A man who was walking in the woods near a city stopped suddenly, very much frightened, and then ran to the nearest policeman, saying that he had just seen hanging from a limb of a tree a ——— a what?"—the items in arithmetical reasoning, the request to tell the time if the hands of the clock were reversed from their present positions, the demand for the three main differences between a president and a king; the sixteen-year tests in which pupils are asked to give the general meaning of four phrases like "Drinking the sea dry," and "Touching the end of the rainbow," are required to tell how many boxes are involved in various combinations of boxes which contain each other, are tested for their ability to explain the meaning of proverbs such as, "Every path has its puddle," and "Rome was not built in a day;" the eighteen-year test in which pupils are asked to listen to a fairly abstract paragraph and give the main thoughts expressed. In all these tests involving reasoning, fairly normal curves of progress from year to year have been obtained, but the level of these curves is from two years below the seeing in the earlier tests, and three or four years below in the fourteen-year tests, to still greater retardation in the higher years. In general, then, one must conclude that the Binet tests of reasoning, which have been used with more than 3000 blind children, indicate a retardation of about two years in children below ten years of age, four years in those who are fourteen, and a still greater retardation in those in their late 'teens. A similar conclusion may be drawn from the results of *group* tests of reasoning, which have been given to several hundred blind children. There would seem to be no possible doubt that blind children are retarded in reasoning as much as, if not more than, they are retarded in school progress, possibly from the same causes.

Applying this evidence of retardation to a list of tests selected from forms L and M of the Terman-Merrill revision which seem feasible for use with the blind, we may expect a retardation of at least one year in half the tests for years IV to VII, a retardation of at least two years in half the tests for years VIII to XIV, and a retardation of four years in many of the adult tests, especially in those involving vocabulary and reasoning. How this retardation will figure out in lower I.Q.'s for the blind must wait upon a thorough trial with these tests. Further evidence of the intelligence status of the blind will be sought

(*Continued on page 60*)

Dr. Allen Says:

My Note Accompanying Pupils' Home Reports in the 1920's

Teachers know that parents like to get good reports from school and so they write as fair ones as they can. Please read this report of your boy or girl carefully and talk it over with him sympathetically—but wisely, too. Though it covers only a short period of time it may indicate what his future prospects are.

Of course the condition of your child's eyesight is a serious matter; but that handicap alone does not mean that he will not be capable of earning his living. All else that he has left him counts far more than what he has lost. If he will only make the most of what he has, you need not worry. Then talk matters over with him and encourage him to get the habit of doing as well as he can whatever he does, whether work or play, never allowing himself just to dream and drift. Remind him, too, that he will probably outlive you and that his happiness then will depend upon his independence of others.

Our bodies and brains are very wonderful. There is scarcely anything we may not accomplish with them if only we begin early enough and keep it up long enough. Theodore Roosevelt was a puny child, so asthmatic that he couldn't go to school with other children. But his father, who discovered in his boy a strong will, showed him how to grow better and stronger; and you know that he became a very strong man indeed. Even when President he could outride on horseback his officers and men. Was he not truly a self-made man?

There is now successfully lecturing about the country one N. C. Hanks, who, when a boy, lost by dynamite explosion not only his eyes but also both hands at the wrists. He usually travels alone, having learned how to get along in all ways—actually even dressing and feeding himself. (He has lectured at Perkins: ask your boy or girl about him.) This man, instead of giving up, has made the most of what he had left, the gift of appearing well and talking well. He is no cripple, for a cripple is one whose handicap keeps him down and out.

A few years ago a boy of fourteen, who had lost both eyes while hunting, came to our school and, finding its ways of doing arithmetic on a typeslate slow and tedious, began doing his sums in his head. From this he gradually came to rely for all school work almost wholly upon his head and thus so developed his powers of thinking and his memory that he soon outdistanced his fellow pupils, skipping one grade after another, until he had courage enough to go back to his home public school, where he also led his classes and from where he went to college, graduating from a four-year course in three and a half years. He then studied law and is today a practising lawyer.

A Perkins girl, having no sight at all, developed before graduation, a few years ago, such skill on the typewriter that she won a prize offered by a business school and is now earning her living as a dictaphone typist in a business office.

Similar instances might be given. But these are typical of what can be done through overcoming obstacles. Since the war, blind youths find more chances in the world than formerly. But only those of our pupils who keep on trying hard and in the right way, at school and at home alike, really succeed. New Year's resolutions are of little avail unless kept day in and day out until they become habits.

Then bid your boy or girl begin now to build for the future—he cannot start any earlier—assuring him that his future is largely in his own hands.

Adaptation in Teaching Physics to the Blind

H. J. Hebbeln

An article in the last issue of the Teachers Forum presented a portion of the material embodied in "A Survey of Physics Courses in Schools and Classes for the Blind." In this, considerable mention was made of the adaptation of experimental work in such courses, and the extent to which this adaptation has gone forward.

The present discussion is an attempt to outline some of the factors which enter into such adaptation, and to point out some of the underlying principles and aims involved. It will be readily understood that an exhaustive treatment of any phase of the subject is impossible at this time since the literature available is still quite limited.

In addition, it seems desirable to indicate the general trends of practice in adaptation as reflected in the comments appended by a number of the physics instructors in their responses to the survey questionnaire. The generous co-operation of superintendents and instructors deserves a much more complete treatment of this material than circumstances permit.

I. Nature of Adaptation

The primary consideration of this study is that pertaining to laboratory procedure in physics as presented to blind students. The public high school course of study generally requires a certain amount of laboratory work, involving one or two experiments or demonstrations per week throughout the school year. The course in schools for the blind should parallel this arrangement as nearly as possible, in order that maximum benefit may be derived by those taking the work, as well as that the unit of work may receive equivalent consideration.

In most schools for the blind, there are usually some who possess a usable degree of vision yet not enough to meet the demands of public school work. In larger high schools having the necessary facilities, these are taken care of in the sight-saving classes where safe and conserving use of vision is the rule.

In most states, the majority of school systems are not large enough to afford facilities for the accommodation of the blind and partially blind in the public schools, and it is found more feasible to maintain state schools specially equipped to handle this work. Since such an arrangement has its drawbacks, it cannot be looked on as final, and improvements are introduced from time to time. However, most of the provisions for the blind are also of benefit to the partially seeing and the modifications required for this group are not difficult. The present study, while taking into account the situation of these partially seeing, will place primary emphasis on those with no useful vision.

As was indicated in the results of the survey, most schools use, as their guide in laboratory work, the texts and lists of experiments prepared for seeing students in public schools. To some extent, it is possible to use these materials with the blind, especially in work not requiring adaptation. But in a large proportion of the work, little meaning is to be derived from experiments as set up for seeing students, and in such cases as the study of light, little practical value can be derived even from adaptations.

In a discussion of the possible need for adaptation of experimental work for the blind, it is obvious that the primary consideration is the absence of vision. Further, it is important to consider the degree of visualization available, since early loss of vision limits this capacity. For this reason, there is a constant difference in the backgrounds upon which the proposed experiences are to be projected. However, such variables are better dealt with as they arise than by the setting up of provisions for those refinements in procedure.

In place of vision, the blind are compelled to make use of whatever other sensory perception will give meaning to experience, such as touch, hearing, taste, smell, and temperature sensitivity. The first two named are those most used to compensate for lack of vision, since the remaining senses are more limited in their possibilities.

Where these sensory channels are used to compensate for lack of vision, it must be remembered that they are merely substitutes and, therefore, should not be assumed to produce results equivalent to those of vision. Again, there is a variation in each sensory channel in terms of actual reality of the substituted material. It may be possible to devise a set-up for a given substitution experiment from either of two different sensory approaches, such as touch and hearing. Whichever of these gives an experience more closely related to the actual normal experience is more apt to convey greater meaning to the individual.

II. Application to Physics

It is not amiss to repeat the statement that physics on the secondary level still applies, in large measure, to the enriching of experience with the physical world. In this light, it is evident that to the blind it is even more necessary to emphasize experience relationships, possibly at the expense of precision. The concept of measurement is necessary, of course, but if the reality of the limitation is faced, confusion and discouragement may be definitely reduced.

In the following paragraphs, it is intended to offer a brief discussion of the several fields of physics in terms of the possibility and usefulness of experimental work, adapted and otherwise. The writer has drawn upon his own experience in a general way, having had a number of years' experience in teaching high school physics to the blind. No attempt is being made to present a list of experiments and whatever details appear are only illustrative.

Properties of matter. The materials of this division are generally quite easy to present; in most cases little or no adaptation being necessary. Objects of identical size and shape and of differing materials can be used to demonstrate the fact of density by the difference of weight in the hands. Linear measurement can be made simple by the use of raised scales. Hardness, elasticity, and ductility all reveal themselves as readily to touch as to other senses. Irregular solids introduce complications in measurement of specific gravity, but the Jolly balance will be found satisfactory if a raised scale is used with an indicator which can be fixated when motion of the spring has ceased.

Mechanics of fluids. Experiments with fluids present a definite problem in the matter of adaptation. Atmospheric pressure can be very simply demonstrated by the usual devices found in most laboratories. Pressure within a liquid can be shown by the use of a bent glass tube, to each end of which an inflated balloon has been attached. Forcing one end of the tube with its balloon beneath the surface of a liquid will cause the other balloon to increase in size according to the depth of immersion. An inflated balloon can be immersed to show decreasing size with greater depth as a demonstration of Boyle's Law. Soap bubbles, which can be touched with the fingers, even though demolished, offer a good demonstration of surface film. Capillary action may be satisfactorily demonstrated with a sponge or wick.

Diffusion of gases ordinarily is most simply demonstrated by the use of the sense of smell. For the seeing, the diffusion of liquids is usually demonstrated by the introduction of colored liquids into clear liquids. As a substitute experiment, this demonstration can be carried out using the sense of taste, or, less directly, hearing by the use of electrical circuits.

Mechanics of solids. It is obvious that the mechanics of solids demand greater ingenuity for their demonstration than is required for some of the earlier principles and laws. Concepts of variously accelerated motion, while quite obvious to one with vision, are only indirectly evident to the blind. The ear serves

imperfectly as a receptor in such cases, although it is possible to arrange an inclined plane in such a manner that rolling balls can show their acceleration by clicking over equally spaced markers. Inertia and the laws of motion can be demonstrated to some extent by means of the same apparatus used with seeing students. Hearing two simultaneously released objects strike the floor at the same instant, even though one of them received a horizontal impulse, is just as convincing as the visual experience. Other experiences in the mechanics of solids may respond to adaptation through touch. This is especially true regarding components and resultants of forces as well as regarding machines.

Heat. Demonstrations of facts and laws concerning heat are readily carried out, for the most part, through simple adaptations of standard apparatus. While a demonstration such as that of the ball and ring satisfactorily points out the fact that metals expand with heat, this is more effectively brought out by means of the linear expansion apparatus which magnifies the expansion to such a degree that it can be detected by touch, or, by the use of raised scales, actually measured.

For the expansion by heat of liquids and gases, it is easy to develop demonstrations using stoppered flasks of air and water in various combinations. Also, by the use of cracked ice in a stoppered flask having a funnel of water in connection, it is possible to show the change in the volume of ice as it melts.

The comparative conductivity of various metals is demonstrated with standard apparatus which can be obtained at little cost or can be easily improvised. It might also be possible to apply the same principle to show the insulating qualities of various materials such as wood, asbestos, wallboard, and other types of building materials.

Sound. The work in sound is particularly important to the blind because the auditory channel is much more relied upon in the absence of vision. For this reason, the blind student should be permitted and encouraged to explore this field to a much greater extent than is usual with the seeing.

The experimental material in the field of sound may be used to whatever extent will satisfy the needs of the students. In a large proportion of the work, little or no adaptation is necessary, such as in the investigation of sound characteristics, of reflection, of resonance, and of overtones and harmonics. Measuring the speed of sound in air is possible by the use of electrical devices.

One of the most important aids in the study of tone structure was provided by the comparatively recent development of the electric organ. Tone qualities are built by setting up combinations of nine harmonics, making possible an almost infinite variety of tone qualities. Illustrating tone qualities in this manner is much more convincing as a demonstration than the method of filtering out various frequencies in former demonstrations.

The use of such aids as the oscillograph and the vibrograph has no meaning for the blind although diagrams of the wave forms are found in the texts. Since the latter serve primarily as visual aids, their adaptation would be twice removed and useful primarily to those with a large degree of visual imagery.

Light. To a large extent, experimental work with light is very limited in meaning for the blind, and its main purpose is to contribute to background knowledge. The nature of a beam of light can be suggested by using one of the reflector type of electrical heaters. In this manner, a beam of heat can be directed through the cool air and even glass, to warm the face and hands of the student without warming the intervening media. Demonstration lenses of the largest type are useful in the study of focal lengths in conjunction with diagrams appearing in the texts.

For those with a limited amount of usable vision, it is possible to make working models of telescopes and microscopes. Extreme care must be exercised, however, in the extent to which these are used and the manner in which the work is conducted.

Magnetism. The actual presence of magnetism is perceptible to the seeing only in its results. The lack of these visible manifestations in the case of the blind preclude presentation of the refinements of the compass and the galvanometer but an understanding of the nature of magnetism is possible through most of the ordinary experiments dealing with the subject. Quantitative work may be carried on to some extent by the use of raised scales, straight or circular as the case may require. Diagrams found in the texts are again found useful, especially in discussing field strength and direction.

Electricity. Experiments in electricity are adaptable to a large extent. The sense of touch is important in observing the attracting force of electro-magnets, as well as the mechanical effects of motors. The presence of electric currents in various circuits studied in this division is detected most satisfactorily by means of earphones. With these, it is possible to obtain a sensitivity threshold equal to that of the highest grade galvanometers, except that direct measurement is not possible. One can make use of this method of detection in connection with several adaptations.[1] Such principles as those of transformers and induction coils can be demonstrated satisfactorily without special adaptation.

Invisible radiation. Work with invisible radiation calls for little adaptation. Models of the electrodes of vacuum and X-ray tubes can be constructed on a larger scale and with these the nature of these radiations can be made quite clear. The use of ordinary circuits and equipment is satisfactory where more extensive sequences are possible and feasible.

III. Trends in Teaching Practices

From the foregoing discussion, it is evident that in the field of physics it is possible for the blind student to obtain a wealth of experience in nearly all of its divisions. It is also apparent that while a fairly large number of adaptations are necessary, they can generally be developed from ordinary physics laboratory apparatus. This use of available apparatus with the addition of some special features, makes the experience possible.

This phase of the study would not be complete without some reference to the experience of those who are similarly active in this field and type of work as reflected in their comments appended to the questionnaire responses. It will be unnecessary to quote from many of these comments since similar ideas are frequently expressed by several instructors.

Opinions of instructors range between the feeling that best results are obtained from maximum participation on the part of pupils by means of adaptations and the feeling that limited participation as encountered in unadapted experiments is more effective. The following statement by W. E. Chadderdon of the Louisiana State School for the Blind reflects an effort in the direction of adaptation and participation:

> We use a single demonstration table and attempt to follow the text book precisely in demonstrating the work as we come to it; supplementing with individual laboratory work wherever and whenever reasonable.
>
> As we experiment with so many possibilities, we concede the fact that there are many items entirely or in part missed by some of the pupils; but at different times we catch the interest of each pupil so that by the conclusion of the year's work the course has been of value to every pupil.

A similar procedure with some modification is indicated by the physics instructor (name not mentioned) of the Ontario School for the Blind:

> Regarding the adaptability of experiments for blind pupils, my experience, though rather limited, has been that it is hard to adapt almost any experiment so that a class of blind pupils can perform it in its entirety. By blind I mean totally so. It is necessary for pupils with a degree of sight to help the above, and the teacher has

[1] H. J. Hebbeln, "Some Uses of Hearing in the Study of Physics," *Teachers Forum for Instructors of Blind Children.* New York: American Foundation for the Blind, May, 1932, p. 91.

to record all readings of instruments. . . . .

I think the class should be taught in small groups of six or eight pupils, devoting more time to the work than in seeing schools. A one-hour laboratory period would be worth a great deal more than two half-hour periods.

In contrast to these statements is the following, quoting, in part, a statement of B. L. Berhow, principal of the Minnesota School for the Blind:

If we could have the proper equipment and full room and tables reserved, it would be questionable to know just how much good a student would get out of extreme adaptations such as many experiments would demand. I say this in defense of demonstration, discussion and observation as we conduct the course. Also, we are in great need of the time which we are now saving from a laboratory. We have no research study, however, by which to show we are correct.

The trend toward the carrying on of experimental work by the blind in a normal situation without adaptation, is apparent to a greater extent in classes for the blind in the public high schools. The following excerpt from the comment offered by Wm. E. Quiette, special teacher of braille students at the Polytechnic High School in Los Angeles, emphasizes this trend:

We have had braille students taking physics for a number of years. All have done very well in the subject, especially from a grade standpoint, and, I think, from the side of content as well.

Our students attend the regular classes right along with the seeing students, although they do return to the braille rooms for special teacher help. Therefore, they use the same text book, the same laboratory equipment, etc., as the regular students.

In European countries is found an attitude that is strikingly different in regard to the importance attached to the study of physics. Dr. Erich Wittke, head teacher of the school for the blind at Berlin-Steglitz states in part:

In all our institutions for the blind Natural Philosophy is taught under the name "Work Science." In Steglitz we give three class hours per week for four years. We have no special book for teaching the blind (adapted manual), but each teacher works out his own scientific procedure. I have given instruction in this course for many years myself and have always met with great interest and good success. We must require an entirely fundamental scientific treatment in view of its later occupational value.

These few excerpts are fairly representative of the variety of practices followed.

IV. Summary

The purpose of this article has been to discuss adaptation in the instruction of the blind with particular reference to its application to the teaching of high school physics. Regarding laboratory work, adaptation was described as the presentation of the subject-matter, either in the form of experiments or demonstrations, in such a manner as to reduce to a minimum the disadvantages resulting from a lack of useful vision. It was pointed out that since the adaptation involves the substituting of other sensory channels for vision, too great a departure from the original experience reduces its reality. While the concept of measurement is important, it should be recognized that its application in the absence of vision is definitely limited.

Further discussion suggested the possibilities for adaptation of laboratory work in the several divisions of the subject. Satisfactory presentation, with varying degrees of adaptation, is possible in all divisions except light.

Excerpts from the statements of various instructors in physics in schools and classes for the blind revealed that there is wide variation in the amount of adaptation used in laboratory work. Some feel that maximum adaptation and participation on the part of blind pupils is both necessary and desirable, while others feel that the laboratory work is most effectively presented with the least possible departure from the original form.

Our Bookshelf

KATHRYN E. MAXFIELD, PH.D.

THE reading of *The New Beacon* and *The Teacher of the Blind* is a stimulating experience these days because of the calm adjustment shown in their pages to the stresses and strains which surround their publishing. In fact both magazines seem to have gained somewhat in force and vitality.

Unavoidably, the war and its tragedies are recognized. For instance, under "Home News" the November, 1940 issue of *The New Beacon* announces the loss during an air raid of the St. Dunstan's Talking Book recording plant, mentions a change of address made necessary for another organization because of "enemy action," comments on the cost of repairing a bombed workshop, and speaks of the fortunate escape of seventy blind men and women in an air raid.

A striking thing about this magazine, however, is the quality of professional article now appearing. The ability to address oneself to the task of writing a thoughtful educational paper in the face of violently disintegrating factors is distinctly noteworthy. This discipline is apparent both in the editorials and other articles.

The last three issues of *The New Beacon* contain articles by R. Lissau and Leonard Hardcastle alternately, on the teaching of geography, which are an outgrowth of a series by Mr. Hardcastle which appeared in *The Teacher of the Blind* from 1935 to 1937. Teachers of geography will find something of interest in all of them, but the last two seem to give promise of introducing a constructive element into this field which has not been especially apparent during the last few years, so far as published material is concerned. (Both magazines may be borrowed from the library of the American Foundation for the Blind without cost except for return postage.)

Probably no one will agree with everything which is said by either gentleman, but possibly somebody may be inspired to think and to write more fully on the subject—even to discuss what geography can, should and does mean to the blind.

There is still much fundamental psychological research to be done before subject matter like geography can be made as meaningful to those without sight or with poor vision as it should be. Experiments like one reported from England this year give a little insight into the sensory perceptions upon which the blind must depend, but far too little work of this sort has been carried to a really conclusive stage.

Two experimenters repeated on one blind and a few seeing subjects an experiment previously performed by E. Rubin, the purpose of which was to discover existing differences between the visual and the tactual perceptions of *straightness*. (Crewdson, J. and Zangwill, O.L.: "A Note on Tactual Perception in a Blind Subject," *British Jr. Psychol.*, 1940, Vol. 30, pp. 224-229.) This was done by what were called the "short-arm" and the "long-arm" methods; that is, with the elbow and the shoulder functioning as pivots.

With all of the subjects it was found that the edge which seemed straight to the moving finger was in reality curved away from the body, the degree of curvature being greater with the "short-arm" method. The edge which was straight objectively and visually seemed to the finger to be curved inward toward the body.

The results for the blind subject were not sufficiently different from those for the seeing to warrant comment in this brief space. However, the fact that for both the blind and the seeing the tactual stimulus of a straight edge produces a subjective experience of *curvedness* is worth keeping in mind.

Educationally speaking there is much need for a better understanding of just such basic data as this—data which give a truer concept of the realities with which the blind deal.

Friends of Dr. Frieda Kiefer Merry and Dr. Ralph V. Merry will be interested in their new book on child psychology which has been favorably reviewed in newspapers and professional journals. (*From Infancy to Adolescence: An Introduction to Child Development.* Harper, 1940. xvii + 330 pages.) The book is intended first of all for introductory courses in child development for colleges and especially for teacher-training institutions. Secondarily, it is designed for use in discussion groups such as those sponsored by the American Association of University Women and the parent-teacher groups. Much of the material in the book may be found in other recent publications but the section on the use of radio seems to offer something special for teachers and administrators working with the visually-handicapped.

(*Continued from page 52*)

through the use of the Wechsler-Bellevue Adult Intelligence Scale with blind adolescents. Fortunately Wechsler's Verbal Series of five tests and his vocabulary test can be used practically without change.

Finally, mention should be made of Brown's Institute of Juvenile Research Tests for the Visually Handicapped. This is a point scale developed for use with children having any degree of vision from normal to totally blind. Its tables of norms, however, are based upon the attainment of seeing children, so it should ultimately yield direct evidence upon the relative abilities of the seeing and the sightless. Its most obvious use is in sight-saving classes and in clinics, but it has been used successfully in a few residential schools for the blind.

How intelligent are the blind? We have no scientific evidence about the adult blind, except in so far as those are involved who were tested during their course of study in a residential school. But the constancy of the I.Q. would lead us to expect our graduates to remain in the same general group through life —superior, average or inferior. We should say the same about people who lose their sight after school days: blindness becomes a very serious handicap in social intercourse and makes it much more difficult to keep up with events, for even those who learn to read braille have at best a slow and limited tool to work with. About blind school children we can speak with more authority on the basis of our extensive testing: both the direct and the indirect evidence seem to point to at least a two-year retardation in school work and in the abilities our intelligence tests measure. With the improvement and extension of our tests more definite statements may be made. Our immediate program includes a 1940 Hayes-Binet adaptation standardized upon the blind in residential schools yielding a "blind I.Q." for classification purposes within the schools; the use of the five verbal tests and the vocabulary test of the Wechsler-Bellevue Adult Intelligence Scale with children from fourteen years upward and with blind adults; some use of the Brown I.J.R. Tests for the Visually Handicapped which were standardized upon the seeing; and a selection of tests from the L and M forms of the Terman-Merrill revision of 1937 which may be used with the blind without change. We hope ultimately to construct comparison tables to translate the scores obtained in any one test into equivalent scores in each of the others, and then we can give a more explicit and satisfactory answer to our question, "How intelligent are the blind?"

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for
Instructors of Blind Children

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The Education of the Mentally Handicapped Blind Child

BERTHOLD LOWENFELD, PH.D. AND HARRY SPAR

DURING pioneer days in the education of the blind, workers did not concern themselves with the problem of the mentally handicapped blind child. The necessity of convincing the public of the practicability of education for the blind as a whole demanded that the emphasis be placed upon the most educable blind and that the more complex educational problems be passed over. As the history of the education of the blind proceeded and the educability of sightless children became an accepted fact, problems of money-raising, publicity, administration, etc., ceased to be the primary concern of educators. More time and attention were then directed to specific instructional problems.

Obviously the first problems which presented themselves were those of surmounting the technical and mechanical difficulties of reading, writing and mathematics and developing special methods in other subjects. After the introduction of special techniques it became apparent that the blind, given the instruments necessary to bring their educational possibilities up to a par with those of the seeing, fell into several categories, each of which provided its own peculiar problems: the preschool group, the defective vision group, the useful vision group, the deaf-blind, the mentally retarded, and the uneducable feeble-minded blind.

Although Samuel Gridley Howe, as early as 1848, made the statement that "the standard of bodily health and vigor, then, being lower among the blind, the inevitable inference is, that mental power and ability will be less also," (Howe, S. G., *Sixteenth Annual Report of the Perkins Institution and Massachusetts Asylum for the Blind,* Metcalf and Co., Cambridge, 1848, p. 38), this was not based on a true recognition of the problem of the subnormal blind child, but was rather a contention that the blind as a whole were intellectually inferior to the seeing. In 1908 Dr. Edward E. Allen recognized the special problem of mental retardation when he said: "I am able to state that about one-sixth of the blind children already recorded are also feeble-minded . . . all these are practically unprovided for." (Allen, E. E., "The Feeble-Minded Blind," *Outlook for the Blind,* 1908, Vol. 2, p. 77.) Since then educators of the blind have become increasingly aware of the large number of sightless children who are unable to benefit from the standard curricula in schools for the blind. The increased use of achievement and intelligence tests promises to give a more reliable indication of the extent to which subnormality is found among blind children. Merry indicates that "The incidence of feeble-mindedness among blind children of school age has been variously estimated as from 5 to 20 per cent, and 13.3 to 55 per cent have been classified as dull, backward, or border-line cases, depending upon the definition and limits of mental deficiency employed." (Merry, R.V., *"Problems in the Education of Visually Handicapped Children,"* Cambridge, Harvard University Press, 1933, p. 124.)

Dr. Hayes, in his article "Are We Getting Poorer Mental Material in Schools for the Blind?" (*Outlook for the Blind,* December, 1935, p. 186), comes to the conclusion that "so far as we can discover from the figures at our disposal, or deduce from the operation of the campaign for prevention of blindness, or from a consideration of the laws of heredity involved in the production of subjects with different levels of intelligence, we should not fear a progressive lowering of the mental material submitted to the care of residential

schools for the blind." He mentions as a reason for an assumed increase in the number of the blind feeble-minded the fact that their problems are receiving more attention than formerly.

Merry offers evidence in support of his statement that "the general level of intelligence among blind children entering schools for the blind is lower at the present time than it was in former years" by the fact that the percentage of students having an I.Q. below 90 rose from 33.6 in 1924-1925 to 45.0 in 1929-1930. He explains this decline in the intelligence level by the effectiveness of efforts toward the prevention of blindness which have led to a reduction of blindness caused by specific eye diseases such as ophthalmia neonatorum. "As a result of this, cases of blindness now found in schools are caused principally by systemic diseases and inherent defects which frequently are accompanied by mental deficiency." Whatever future research may prove, the fact remains that the education of the mentally retarded blind child constitutes a task which is at last receiving proper attention.

The first question which arises in seeking a solution to this problem is: Where can subnormal blind children be placed to their best advantage? A survey of the available literature on this subject shows that practically all conclusions hinge on the question of which is the greater handicap, blindness or feeble-mindedness. Since it has been generally agreed among educators of the blind that feeble-mindedness is the greater of the two handicaps, the attitude has been taken that feeble-minded blind children should be relegated to institutions for mental defectives. Merry summarizes this viewpoint: "The consensus of opinion seems to be that, since mental deficiency is the more serious defect, blind feeble-minded children should be received in institutions devoted primarily to the care and training of mental defectives." (Op. cit. p. 126.)

It seems obvious that this question is beyond debate when it applies to the blind who have definitely proven uneducable—they belong in the custodial care of special institutions for mental defectives, and they should be accepted there. But when it concerns the mentally handicapped but educable blind child, the negative stand taken by educators appears open to argument and actually their position remains more theoretical than practical: "In theory, none of us admits the feeble-minded; in practice, we all have them." (Burritt, O. H., "The Education of the Blind," *Outlook for the Blind,* Winter, 1916, p. 111.) Institutions for the feeble-minded might not hesitate to accept the uneducable blind, but the special provisions necessary for educating the mentally handicapped blind child have made administrators of such institutions reluctant to accept these children. Consequently, they have either been left in their homes or, as has quite often happened, been grudgingly admitted to schools for the blind. In such schools the attitudes of administrators has allowed for very little serious effort in the direction of providing for them the opportunity for the greatest possible development.

In considering the problem of where mentally handicapped blind children should be educated, it would seem that a decision based on the premise that mental deficiency is the greater handicap can scarcely be justified from the point of view of the educator. The question with which he must concern himself here is rather as to where these children can find the facilities and attention which will best minister to their special educational needs.

There is little doubt that the demands of blindness require more special provisions—special equipment and specially trained teachers—than those of mental deficiency. The ratio of mentally handicapped blind children to the inmates of institutions for the feeble-minded would hardly justify the expenditures necessary to provide for additional equipment and teachers in such institutions; whereas the ratio of mentally handicapped blind children to the students in schools for the blind and the provisions which the extra handicap requires make placement in such schools quite

feasible. The responsibility for the subnormal educable blind child, therefore, should rest entirely upon the schools for the blind.

There are four ways in which these children can be provided for under the supervision of workers trained in the education of the blind:

1. Segregation in a residential school for mentally retarded blind children
2. Special day-school classes
3. Special classes in schools for the blind
4. Special units within schools for the blind.

The first method presents several features desirable from the pedagogic standpoint. Under such an arrangement the special needs of the students would receive the full attention of teachers and administrators, and special equipment and techniques could be employed without conflict or competition with other interests of the school. However, such extreme segregation, in view of the difficulty of the educational problems, might easily lead teachers and administrators to lose sight of their educational aims and allow the standards of the school to gravitate towards a custodial level. Furthermore, the relatively small number of these children and their wide distribution throughout the country would make the financing of such a school very uneconomical, and it is questionable whether the expense which its establishment would entail could be justified even if we were to assume that its greatest benefits might be realized. The only school of this kind in the United States is the Royer-Greaves School for the Blind, at King-of-Prussia, Pennsylvania, where a small number of mentally retarded blind children have been satisfactorily directed in their education under the tutelage of Mrs. Greaves. This system has been more generally adopted in England, however.

We know of only one attempt to conduct a day class in a public school, also in Pennsylvania, and this class was discontinued shortly after its inception.

The method most commonly employed to provide for the education and care of these children is the establishment of special classes in schools for the blind. Although this is the most obvious and convenient solution of the problem, it has many disadvantages which may not be immediately apparent. The idea was taken over from the public school system, where special classes are provided for retarded seeing pupils, but the fact that additional difficulties would result from the use of this method in residential schools was not fully recognized. Although the problem of teaching subnormal and normal pupils together is avoided, the influence of these two groups upon each other outside the classroom is mutually harmful. On the one hand the lower group tends to draw the moral and intellectual standards of the school down to its level and, on the other hand, the constant frustration which the members of this lower group experience from their inability to compete with the majority of the students has a devastating effect upon their morale. In spite of the most conscientious interest in these students on the part of the teachers in schools for the blind, it must be recognized that any school for the blind which is organized as an institution for academic learning will, willingly or not, cater to those students who are able to meet the standards of the curriculum, and any attention that may be given to a special group must be merely incidental.

The establishment of special units for these children within schools for the blind would offer the advantages of the foregoing plans and avoid to a large extent their shortcomings. Such a unit, with living quarters, playgrounds and classrooms set apart within the school, would provide a more wholesome environment by avoiding the undesirable effects pointed out in the preceding paragraph. In classes within this unit the teachers would be freed from the influence of the dominating attitudes and standards of a school for academic learning. Their remoteness from the traditional classroom would give them complete leeway to modify methods and standards to fit the needs of their students without the necessity of making deviations from the norms of the institution acceptable to the rest

of the faculty and student body. It is difficult within the routine of the average school for the blind to depart very materially from either the usual classroom procedures or subject matter without subjecting the students of the special class to the curiosity and ridicule of the rest of the school. Where pupils of comparatively inferior mental ability would be housed apart from the main student body of an educational institution, their association outside of class would be more natural and healthy; moral and intellectual standards would be subject to better control by the teachers, since the simpler methods of education most effective with these students would be free from the scrutiny and criticism of the more intelligent students.

It is very important to emphasize that such a unit within a school should be considered, and explained to persons at the institution, from its positive rather than its negative aspects. There is little doubt that the greatest educational and vocational promise for mentally handicapped children lies along the line of manual and simple industrial training. The unit should be operated ostensibly for those students whose aptitudes—and not limitations—make the type of work which it offers most suitable for them. In this way the stigma which might otherwise be attached to this special work would be avoided.

Within the past few years a plan similar to that which we have in mind has been considered by Dr. Gabriel Farrell, Director of Perkins Institution: "Here at Perkins we are giving thought to this problem and hope that the time will soon come when we can attack it in a concrete way. It would seem to us desirable to have a farm colony with several units upon it. Each unit would house ten or twelve pupils with a competent man and wife in charge assisted by a teacher and necessary domestic help. The programme would be adapted to the individual needs of the pupil, but would be rudimentary in character with emphasis upon work and healthy play. Custodial care would not be provided as that lies outside our province. We would seek to give to the children assigned to the Farm during their formative years such training as they are able to absorb and would aim to equip them with avocations that would be bulwarks against the demoralizing effects of idleness." (Farrell, Dr. Gabriel, "The Blind Mentally Retarded in America," *The New Beacon,* Nov., 1935, pp. 287-288.) The type of children for which this plan is intended is "the group with not enough mental ability to absorb our standard schooling and those too promising to be committed to schools for the feeble-minded." (*Annual Report,* Perkins Institution, 1937, p. 31.)

It should be observed that the plan described by Dr. Farrell is not for the establishment of a special educational unit within the school for the blind, but involves the building of what practically amounts to a new school. If this plan were adopted generally it would mean almost a complete duplication of the schools for the blind. Possibly the few wealthiest schools in this country could afford to do this on a small scale, but certainly the investment necessary would make it prohibitive for the smaller schools.

Concerning the curriculum of our unit, it is impractical in the light of present knowledge to outline any specific plan of required subject matter, but a few general fundamental principles may be considered.

1. The principle of concentrated instruction—teaching by study units. The division of teaching into subjects is contradictory to life experience, and for the child of limited capacity the application of artificial classroom experience to reality is a step often too difficult to accomplish.

2. The principle of accustomed environment. The child is the center of school interests and therefore the things in his immediate environment offer the best points of departure. Starting with the student's surroundings and experiences, the teacher, through carefully planned use of the unit method, can extend the scope of interest to the neighborhood, city, state and so on. A few examples of typical units are: lighting, water, soil, transportation,

communication and civic problems. In employing such units of study the frequent use of field trips by means of which the student can be brought into contact with primary situations being studied serves to facilitate learning. From our experience with such trips at the New York Institute for the Education of the Blind,* as for instance, to Staten Island, to a museum, to a powerhouse or the like, we found that the emotional excitation which resulted from the novelty or uniqueness of the things observed, together with the pleasure derived from the trip itself, stimulated the interest and cooperation of the student to a degree that made his understanding and retention of the material studied amazingly superior to that resulting from the usual formal abstract classroom learning. Thus life is not merely brought into the school, but the school itself becomes life.

3. The principle of self-activity. This principle is quite the opposite of any employed in formal academic teaching procedure. These pupils comprehend and remember not what they have been taught about something discovered by another person, but what they actively acquire through their own efforts. They must be allowed to experiment and observe. In this way they develop personality and are not merely confined to mechanical repetition.

4. The principle of concreteness. Investigations show that blind persons have a tendency to use imaginative or substitutive concepts. Therefore, one of the main tasks of educators of the blind, particularly when working with retarded children, is to provide them with as many opportunities for primary experience and as much concrete subject matter as possible in order that they may avoid inaccurate or incorrect concepts. For this purpose it is desirable to have a large collection of object-teaching material which may be used when observation of real life situations is impossible or incomplete, or whenever it is necessary to deepen or renew observations.

It should be borne in mind that the mentally handicapped child will reach the level of learning readiness at a later age than the normal child. The period of informal learning through play and other experiential activities is extended. Moreover, it may be questioned whether the period of formal learning can profitably be continued as long as is generally attempted today. In many cases it becomes apparent that the child has reached the limit of his ability to benefit from formal training rather early. There can be little justification for keeping such a child in class after this period, when he might derive far greater benefits from practical training in the branches of work in which his capabilities lie, on a basis similar to an apprenticeship.

As indicated earlier, all types of manual training and simple industrial work should be given great emphasis in the educational program of these classes. Under the heading of manual training we would include woodworking, ironworking, simple work in rush and splint, coarse weaving and basketry, broom and brushmaking, simple knitting, sewing, leatherworking, and whatever manual arts local community interests may show a demand for. Industrial training would take in such things as: the operating of a small stand, training in salesmanship, cooking, home economics (as training for domestic labor) and finally, and probably most promising, all forms of farming—poultry raising, gardening, dairy management, fruit growing and general farm operation.

This type of work, determined by the peculiar situation and aptitudes of the individual student, should be the focus of interest around which all other school activities are centered. Such a policy of course is contrary to that followed in the regular school for the blind, where the emphasis is placed upon scholastic work.

If, however, we consider the general situation in the field of work for the adult blind, we

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* Beginning with special tutorial work for slow-learning blind children in 1935, the New York Institute for the Education of the Blind has made increasing provisions for those students who have proved unable to profit from the work of the regular school curriculum.

Dr. Allen Says:

"Little Can Be Gained from the Purely Statistical Report Except for the Purpose of Compilation and Comparison."—(*Dr. French*)

Every morning we pupils of the Allen school had a fresh motto written upon the blackboard. "What is worth doing at all is worth doing well" was one, and doubtless I interpreted it boy-fashion in my required journal. Anyway it remained a watchword with me, especially in planning and refashioning two sister institutions. Overbrook presented an opportunity first, to prove my thesis that an interesting and colorful environment is needed to bring to flower the latent capacities of intelligent young persons shut in by blindness; and second, to help convince the visiting public that the trained blind of parts have something to offer the community besides the emotional satisfaction of almsgiving. The quick results there later justified us of Massachusetts in putting up our more costly divisional plant at Watertown, to be carried on under possibly more nearly ideal conditions. We wished at the same time to socialize its pupils while at school and to improve upon the old ways of educating people at large to understand them and so to supply them, after graduation, with something to do. Thus "seeing is believing" was added to the Howe maxim, "Obstacles are things to be overcome."

Since the life at both places was filled with zest and joy, I was as happy in the one situation as in the other; caught this happiness from my flock and did my best to reflect it outside. My direct means inside was shepherding—daily personal contacts with pupils and teachers. The office being central and easy of access, was open to everybody. I made a point too of visiting each department often and of encouraging rather than criticizing.

But my indirect or outside influence, the main subject of this paper, lay in writing—correspondence, papers, and annual reports. Indeed my pencil was ever active. So, feeling full of hope then, the spirit of honest, useful and cheerful optimism could not but pervade these writings. I actually enjoyed doing the required annual reports; and because the objective was to have these documents read, each was prepared according to the advice: "Write with fury and correct with phlegm."

In preparation I had been all the year entering in a pocket notebook any suggestion, aphorism, apt or colorful quotation met with. Teachers, matrons and pupils, alike conscious that the office welcomed little accounts of their immediate experiences, handed in many. About a month before the annual report was due, I used to retire to some quiet spot, reread every note, also some suggestive essay, perhaps one of Emerson's, and start the penciling as the spirit moved, for a couple of mornings and the afternoon between. Then, the first rough draft having been typed with wide spacing, I figuratively slept on it a few nights; and finally, with some outside criticism, leisurely clarified the message and improved its readability. From Overbrook we sent out a thousand copies; from Watertown over two thousand.

Now every Superintendent has something to report which is of interest to the general public but the thing is to get it read. To this end it must be printed in a good clear easily readable type and must have a non-professional interest.

Principal Burritt and I, and Principal Van Cleve and I, always exchanged reports upon their receipt from the printer, and sent each other expressions of appreciation, a helpful amenity. The latter once replied to my letter about his report: "What you write of my yearbook warms the cockles of the heart."

Creative Dramatics

Frances D'Arcy

Of late a great deal of interest has been manifested in a phase of speech activity known as creative dramatics. This term is used to designate a particular method used by those engaged in teaching the drama. Creative dramatics, however, should not be considered a special technique, but rather a useful tool for every class teacher. It is a tool which may be used for reviewing material already studied as well as in the introduction of new material. As a teaching device, it lends itself to almost every subject included in the course of study.

Creative dramatics is more commonly referred to simply as dramatization. It is to written dramatic material what oratory is to written composition. The content for this form of expression may be drawn from stories, novels, biography, travel, history, poetry and music.

In planning a dramatization a selection is read by the children or read to them by the teacher. Then plans are made for scenes needed, number of characters, types of action and possible dialogue. After these plans have been discussed the class is divided into groups and oral preparation begins. If the pupils are experienced, a leader may be appointed to help direct the group; if not, the teacher will have to advise and suggest until the group becomes seasoned. She should especially encourage the use of good English and naturalness of action. She should also see to it that every child takes some part and should lead the children to an understanding and application of good speech standards. The dialogue for such a production should be clear and definite but it need not be fixed. Speeches may be changed with every presentation as long as the English is up to standard and the ideas are accurate.

This type of activity offers many advantages to any teacher. It may be used as a form of drill. It may be used to create interest in a new topic, to fix facts already learned, or even for the review of an entire unit. Many children may be used in any dramatization, since more than one group may work on the same topic without killing interest. No special dramatic ability is required, for any child can take part. Even if he is shy he may add his one sentence or act as property. If he is overanxious he can be taught by working with a group in which he has one small part, but he should understand that his part is without value unless it contributes to the success of the entire group project. Hence creative dramatics may be instrumental in character training and adjustment.

For those working with visually handicapped children, creative dramatics has special values. In such classes we have many children who are not skilled readers and the problem of securing effective reading is ever before us. "How can I work Mary into the group?" "What can I do to give James a place in the activities of the class?" Well, James should be taught to listen to the history or reading lesson so that he can help when the class is ready to dramatize the material under consideration. Then he will become an active member of his class and will receive his first listening-remembering lesson; and since much of his education will depend upon his ability to listen and to remember, creative dramatics is a stimulating approach to that valuable technique for gaining knowledge. The very fact that these children take part in the creative dramatics lesson will stimulate them to new effort and at the same time help them to learn the history or reading lesson through their ability to contribute to the knowledge of the group and through their ability to reproduce what they have heard. Then, too, blind children need much freedom of movement. They need actual train-

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Radio in the Education of the Blind

Robert H. Barnhart

In modern education many new methods and devices have been used to extend classroom experiences and to expand the student's horizon beyond the textbook and the four walls of the schoolroom. Models have been constructed and studied; objects and specimens have increased the effectiveness of description; field trips have brought cold and often meaningless words to life. Perhaps no other device, however, has so fired the imagination, so furrowed the brow, or so taxed the ingenuity of the school administrator or the teacher as has radio in its invasion of the school—day and residential. Certainly no innovation has extended the experience of the student further or in more directions, or has encroached more upon classroom routine, than has this giant of the auditory world.

When, on November 2, 1920, radio station KDKA broadcast the returns of the Harding-Cox election, only the visionary dreamer could picture the nationwide networks, the transoceanic broadcasts, and the great variety of programs now on the air. Today, these marvels are commonplace, and their value is being recognized in the field of the education of the blind, for the force of such a vast and unpredictable structure as radio penetrates schools as well as homes.

Even before 1925 radio was recognized as a great source of entertainment and enjoyment to "those who live in the dark." In those early days when receiving sets were expensive, the American Foundation for the Blind and many metropolitan newspapers raised funds of large amounts with which to purchase radios for the blind. Sets were first introduced into schools for the blind to provide entertainment for the pupils. Little is known of the progress of the use of radio in residential schools and special classes for the blind. Except for a paper presented by Dr. P. C. Potts at the 1932 convention of the American Association of Instructors of the Blind there seems to be no literature on the subject. This lack of information, together with the increasing importance of radio, led to a survey, "The Uses of Radio in Residential Schools and Special Classes for the Blind," the results of which are reported here. It was not possible in this survey to consider the use of radio by the adult blind although, in future years, the adult blind will undoubtedly use their radios more advantageously as a result of their present-day school training.

Questionnaires covering the uses of radio in and outside the classroom, and probable future uses, were sent to sixty residential schools for the blind in the United States and five in Canada, and to the supervisors or teachers of special classes in twenty-one public school systems. The following discussion is based upon returns from thirty-eight residential schools in the United States and three in Canada, and from three braille classes. For convenience and for other reasons, reports by the three groups will be considered separately.

Twenty-five of the residential schools reporting in the United States, representing approximately 3,260 pupils, take advantage of educational broadcasts occurring during class time. The thirteen schools not using radio in this way have an enrollment of approximately 970 pupils. It should be pointed out that the use of radio programs occurring during the school day cannot be entirely separated from the use of certain broadcasts outside class time, though questions relative to the two types of use appeared in different sections of the questionnaire. This overlapping grows out of the fact that the subject matter of some broadcasts occurring outside class time is included in classwork.

The survey further revealed that programs concerning national and international affairs and special events are listened to during class

time in fifteen schools. The Damrosch Music Appreciation Hour runs a close second in popularity, with twelve schools enjoying it regularly. Eleven schools schedule programs of Columbia's American School of the Air. America's Town Meeting of the Air, Cavalcade of America, Lest We Forget, Ohio School of the Air, science programs, and news, complete the list of broadcasts mentioned. Some schools, however, indicated the use of other programs without naming them.

Many methods and combinations of methods are employed in the correlation of broadcasts with class work. Certain classes in civics, history, and geography require reports on programs heard outside class, and sometimes allow credit for these. Frequently the teacher prepares the pupils for the broadcast by giving them information in regard to the topic in advance, or by leading a discussion based upon the pupils' experience or collateral reading. As a rule, discussion also follows the program immediately or very soon afterward. Preparation for the broadcast is as important as preparation for any other activity, and usually includes a valuable study of the subject.

This method applies to musical programs as well, although here appreciation is usually a more important factor than in the social studies. Some of the schools make use of radio dramas in English and literature classes.

The benefits resulting from educational broadcasts are varied. Students are stimulated to read more widely and in new fields; participation in discussion is increased. Broadcasts bridge the gap between the school and the world outside, making prominent people and events more real. Contact with controversial issues challenges the student and broadens his outlook. Listening to better broadcasts aids in the development of better listening habits. In addition to increasing the pupil's knowledge of the technical aspects of music, the good musical program raises the level of appreciation and helps set standards of cultural values.

Teacher and pupil alike share the benefits of the extensive and careful research that goes into the production of many broadcasts as well as the stimulation coming from considerable quantities of new subject matter which would not otherwise be available. It is humanly impossible for any one teacher to have the background of varied experiences and the range of knowledge represented by the educational broadcasts now available in this country.

That radio in education is not an unmixed blessing, however, is immediately apparent from an examination of the unsolved problems accompanying its advent into the classroom.

One difficulty reported is that broadcasts do not allow for individual differences among pupils or for different grade levels. Until local stations and regional networks provide more services to schools this criticism will remain unchallenged. At present the major networks are doing all they can to give the public schools the kind of programs they want and can use. In most instances, the problem of individual differences can be met only by the teachers themselves through the preparation of the pupils for the broadcast and through the interpretation and correlation of the materials presented. Such effective use of radio in the classroom necessitates a great deal of work, however. Fortunately, advance information concerning the subject matter of broadcasts is rapidly becoming available. Local stations or the networks to which they belong will supply this in related series, often indicating the probable grade level. By listening to one or two such programs the teacher can gain a fairly accurate estimate of the probable usefulness of that particular series, for the general characteristics remain constant. Critical listening by the local teacher is sometimes the only basis upon which a decision can be made, but the instructor should not fail to consider the reputation and reliability of the speaker, or the importance of the event and its relation to the picture of life which the school is presenting to its pupils.

The lack of braille material related to the broadcasts constitutes a real problem. As sta-

tions increase the quantity and improve the quality of advance information on programs, this difficulty may be more easily solved than at present. However, the dearth of braille material on subjects of current interest is perplexing to teachers of social studies whether they use radio in class or not, so this demand may lead to the preparation of more adequate literature.

The fact that the times of broadcasts do not coincide with class schedules in a particular school is a difficulty that can be met only by that school. Now that many programs are scheduled months in advance, it is usually possible to make the necessary adjustments. For example, in one school where the change in class periods came during a thirty-minute broadcast, the two classes affected were grouped together to listen to the program, and the pupils were quite willing to forego the five-minute interval between classes. While this arrangement would not solve all such problems, it does indicate that solutions can be found. Because there are millions of pupils listening, the public schools are given and will continue to be given preference in the assignment of time for educational broadcasts. Frequent surveys are being made by networks and other organizations to determine the hours that will best serve the largest number of pupils, and broadcasting schedules are made in accordance with the findings of these surveys. To reduce the inconvenience caused by the various time belts the networks present some programs two or three times daily. Local stations often transcribe network programs and rebroadcast them at hours more convenient for the local listeners. Requests for such service should be made directly to the owner or manager of the local station and should be accompanied by evidence that more listeners will be served if the program is put on the air at a time other than that scheduled. Even with all these efforts to make programs available, changes in class schedules may sometimes have to be made in order to hear certain broadcasts. While only a few schools have reported serious conflicts between broadcasting and class schedules, this matter has been given considerable attention here because the indications are that the use of radio will increase.

Along with the consideration of these unsolved problems, it is interesting to note the reasons given for not introducing radio classwork in thirteen schools. The chief of these are lack of equipment, and poor or impossible reception, caused for the most part, by difficulties which to date have baffled radio engineers. In a few cases where programs are not available because the local stations are not affiliated with any network, the installation of more powerful receiving equipment might solve the problem. In only two schools is radio unused because it is considered of too little value.

The value of radio programs in comparison with regular classwork is determined by the extent to which they are carefully selected, properly prepared for, and painstakingly related to the lives of the pupils. That the content of programs may be concerned with a larger field than the immediate task of the classroom is one of their chief assets. The fact that educational and cultural broadcasts are much more numerous at the junior and senior high school levels than below them reduces competition between radio and work in the tool subjects of the elementary grades. By the time a pupil reaches the junior high school his knowledge and his perspective of life should begin to expand.

Programs such as *Frontiers of Democracy, New Horizons,* and *This Living World* (three series of Columbia's American School of the Air for 1939-40) go a long way toward giving reality and meaning to history, geography, current events, and other subjects. These programs cannot and do not take the place of books, teachers, and classwork; but they do provide tremendously interesting points of contact with life today and with the relation of the past to the present. The Columbia System has further cooperated by preparing a Teachers' Manual which makes it possible for instructors to select and prepare for

programs in advance. *Gallant American Women, Ideas That Came True,* and *How Do You Know?,* NBC presentations, are but a part of this network's services to schools during the past year. There is no better place to begin to gather information on what will be available in the future than at nearby local stations. The Columbia Broadcasting System prefers that teachers contact these rather than its department of education. The National Broadcasting Company on the other hand has the Department of Education answer inquiries addressed to it. The Mutual Broadcasting System provides its information service largely through its local stations. The American Foundation for the Blind has a list of educational and cultural programs as well as sources of further information, which will be sent upon request.

In spite of all these services to schools a larger selection of educational and cultural broadcasts is found outside than during class hours, due to the fact that more than three-fourths of all listeners are adults. Inasmuch as broadcasting in this country is a commercial enterprise and adults buy the products advertised, the finest programs will continue to be scheduled during late afternoon and evening hours and over the weekends. This arrangement is by no means vicious, for the thirty per cent of commercial broadcasts makes possible the seventy per cent of non-commercial or sustaining programs. The majority of educational and cultural features are found among the latter, though the trend in broadcasting of all types is toward improved programs and a better arrangement of schedules during the week. To verify this the sceptic need only check the list of programs offered during any one week five years ago and then study the present transcription files of a large station. This improvement has come about through the conscientious efforts of the broadcasters and the demands of the listeners. An advertiser is usually willing to put a better program on the air if he finds that an inferior one does not produce sales, so the fact that the quality of many commercial programs is still poor is a commentary on the tastes of adult listeners.

Interesting reports were received from thirty-eight schools concerning programs heard by students after class hours. To a great extent the listening habits of these pupils will probably be fixed by the time they leave school. The level of appreciation and tastes constitutes a problem of greater importance in the residential schools than in public schools, because the former have direct control of and responsibility for their pupils during the greater part of the year. That some form of guidance in program selection should be undertaken is indicated by the supervision attempted in twenty-three of these schools. While there are admittedly no objective criteria upon which to base judgment, seventeen of these schools, with a total of almost nine hundred pupils represented, feel that such guidance has resulted in better listening habits and tastes among their pupils. When allowance is made for the fact that there are few programs for pupils in the elementary grades, that participation is mostly voluntary, and that only slightly more than half the schools reporting have guided or supervised listening, this trend becomes quite significant. The supervisory methods vary from merely calling the attention of the pupils to the more desirable programs to assigning certain programs for classwork. In some cases the matron or cottage mother supervises the listening; in other instances the teacher or some other interested person acts as supervisor or leader.

The "listening group" has been introduced in two schools. Groups of students meet informally to listen to America's Town Meeting of the Air. The topic and the speakers are discussed before the broadcast begins, and lively discussion usually follows its conclusion. The interest stimulated in groups such as this may readily lead to a search for further information, and listening to forums, discussions, and talks may be incorporated into the activities of school clubs which center around the social studies. The experience gained by the pupils in discussing controversial issues,

and in searching for further information upon which to base their opinions and beliefs, is the best citizenship training possible in an academic setting. Blind pupils thus prepared can enter into participatory citizenship with the seeing, and often at a level above that of their seeing companions.

The success of guidance methods depends upon a number of factors. Broadcasts must be carefully chosen and the listeners should have some advance knowledge of the program. In presentations of current interest or of a controversial nature the leader or supervisor should be capable of acting as moderator or chairman for any discussion that may follow. In its beginnings at least the success of supervised listening depends to a great extent upon the enthusiasm and ability of the leader. Radio programs, like outside reading, may be designated as required or optional, depending upon their educational value. However, when listening is compulsory it is deemed advisable to grant credit or recognition in some form. Effective listening should be encouraged by permitting no distractions or annoyances within the group.

That the radio may sometimes take the place of profitable reading, that pupils listen to some inferior programs, and that there are many poor programs on the air, are true statements. Yet good literature has never been discredited because of similar drawbacks, and it may be assumed that good taste in listening like good taste in reading is acquired. If radio takes up all of the time that formerly was spent in reading, then certainly there should be regulation of listening during leisure time. Before radio came into schools other competing activities were controlled in order that leisure time might be available for reading.

It should not be supposed, because of the emphasis placed on the values of guided or supervised listening, that every educational and cultural broadcast can be taken advantage of or that all mere entertainment should be forbidden. Programs should be selected not only because of their excellence but also in terms of the educational aims of the school and the more specific aims of particular classes. It should be remembered that programs arranged solely for entertainment are quite worthwhile. If it is necessary to make definite allotments of time for listening for pleasure, this should be planned when entertaining programs are available.

Two of the three Canadian schools which replied to the questionnaire report that they use radio in the classroom. Programs prepared by the Provincial Normal College, on topics related to general science, the social studies, and health, are used in one school, while international affairs are stressed by the other. The pupils of the former school listen to more musical programs than do those of the other. No systematic attempt is made to use radio in the third Canadian school because of a lack of suitable broadcasts.

Considerable use of radio in the classroom is reported by the three braille classes from which data was secured, although most of the programs are listened to in the regular classes with seeing pupils. Inasmuch as the chief function of many braille classes is to prepare pupils to recite in classes with seeing pupils the same experiences should, in so far as possible, be shared by both groups. In regard to the value of radio to pupils in these classes one supervisor of braille and sight-saving classes writes: "The radio for the blind child is one of the most effective means of acquiring knowledge. Here he competes on an equal footing with his seeing classmates. . . . We find it is often a stimulus to greater endeavor along other lines." Two of the three braille classes reporting will increase their use of radio during this year. The pupils often listen at home to programs suggested by the teachers and the latter feel that the students thus guided are showing an increasing interest in better programs.

Although eighteen residential schools either have reported no plans for the future use of radio or have questioned the wisdom of changing their present schedules, definite plans are being made for increasing the use of radio programs in twenty schools. Train-

ing in civic responsibility and in the ability to discriminate between worthwhile and inferior programs are mentioned as the two chief factors determining future procedure. The improving quality and increasing quantity of good programs have figured largely in bringing this about.

Inadequate listening facilities, poor programs, inconvenient scheduling of programs, lack of correlation between programs and classwork, the belief that radio can add little to the classwork already being done—are the reasons given for not increasing the use of radio. However, several of the eighteen schools planning no increased use of radio have not included radio work in their curricula in the past for similar reasons.

Probably the most important question in planning for the future use of radio in education is: how can it be used most effectively? The matter of immediate concern is to provide the best possible listening conditions both in and out of class. Class time listening is the more effective, providing there are sufficient receiving sets or sets which can be moved from one room to another. Except on occasions when a large number of pupils are interested in the same program, listening in an auditorium is unsatisfactory because of the distractions likely to occur in a large audience. Perhaps the greatest source of annoyance to listeners is an inadequate receiving set. A receiver need not necessarily be large or expensive, but it does need to be dependable and to reproduce tones with great fidelity. Few of the very tiny sets now on the market meet these requirements. Usually they are lacking either in quality of reproduction or in power to overcome minor forms of interference, or they are in constant need of repairs or adjustment. Moreover, these small sets seldom produce sufficient volume without distortion. Any new set should be given a rigid trial under actual listening conditions before it is purchased.

Rooms for listening outside class should be chosen with great care, for at such times there is usually more activity, more noise, and more conflict of interests. The room for such listening should be arranged informally and comfortably, and reserved for the sole use of the listening group during program hours.

The surroundings and equipment being adequate, the next important detail is to make sure that the program is properly tuned in and that none of it is missed. In classroom listening it is suggested that the teacher appoint some pupil to remind her of the time about two or three minutes before the broadcast for it is irritating to many listeners to miss the opening musical note or sentence, no matter how inconsequential it may be. These details are minor in themselves, but they are important to the success of listening where more than one person is involved.

When pupils have learned how to listen under reasonably adequate conditions, and when they have begun to participate in discussions and to make intelligent evaluations of broadcasts, they may safely conduct their own listening groups with only an adult observer or referee present. There will probably be only a few pupils who can learn to lead such groups, even though there be careful guidance and enthusiastic leadership in the beginning. However, the proportion may well be greater than among the present adult population. With slight adaptations what has been said applies to musical programs where discussion is not so likely to follow.

From the beginning some pupils will be alert, intelligent listeners; some will never be able to reach this level. This should be no cause for worry, however. The situation is much the same when pupils are learning to read. Some become proficient readers; most learn to read only moderately well; and a few cannot learn to read at all. Individual differences among listeners are probably as great and as perplexing as among readers; all students should be given an opportunity to advance as far as their ability permits.

The use of radio might be developed to the point that it would seriously interfere with the socialization, recreational, and health aims

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Education of the Blind—A Review

W. W. Spellings, Ph.D.

Education of the Blind, a study of methods of teaching the blind, was copyrighted in 1940 by the World Book Company, Yonkers-on-Hudson, New York. It was edited by Dr. Merle E. Frampton, Principal of the New York Institute for the Education of the Blind, fifty-two members of the staff of the Institute having contributed to its contents. The entire work of 436 pages is divided into the following parts: (1) Guidance in the Elementary Grades; (2) Enriching Life in the Secondary School; (3) The Fine Art of Music for the Blind; (4) Vocational and Prevocational Experiences; and (5) Pathways to Abundant Living for the Blind Child. These parts are treated in a total of twenty-eight chapters.

In the Foreword to the book, Dr. Frampton makes two statements which deserve special consideration because they explain the common viewpoint of the contributors to the volume. The first is, "This present volume is made up of articles written by teachers of the blind who have specialized in the various fields of instruction. To the discerning reader it is apparent that there is one major point of view that is held in common by all these teachers; namely, the blind child is first of all a normal child. Aside from his handicap he has a normal mental and physical structure." The second statement is, "This volume does not treat directly of the philosophy or psychology of work with the blind child, but it is necessary to point out that the education of these children must, like the education of sighted children, prepare the individual child for successful living in the complex socio-economic life of the changing world of our present age." The authors are to be commended for their point of view as expressed in the above quotations; for it is to be feared that far too many seeing people, some of whom are even engaged in work for the blind, still consider the blind a very abnormal group, to be pitied and dealt with mainly through charity. This book would serve a useful purpose if it could awaken such people to the realization that most blind people want to be socially useful and economically self-supporting.

Parts one and two deal comprehensively with methods and techniques employed in teaching the blind; with the use of such appliances as the braille writer, the braille slate, the arithmetic slate, the typewriter, and other teaching equipment; and with the courses of study and training in the primary, intermediate, and high school grades.

Doubtless all teachers in schools for the blind agree that reading is the basic subject in the curriculum. It is the tool through which the child may secure for himself a great deal of pleasure and enjoyment and be enabled to gather information from the printed pages of the textbooks used in the various fields of study. This fact is fully recognized by the authors as is shown by the following quotation:

> "No subject of the curriculum has a more fundamental bearing on the general success of the student than reading. The use of books, at first for pleasure and later on for the gathering of information in every field of knowledge, is so essential to a child's happiness, to his progress in his school work, and to his pleasure and profit in the leisure hours of his maturer years, that every teacher may well consider how she can instill in her pupils a love of reading."

Beginning teachers and those who have taught reading should find it both interesting and helpful to investigate what this book has to say about the methods used in teaching older students as well as children in the primary grades to read braille.

Chapter seventeen is a discussion of "Mu-

sical Education of the Blind." Those who wrote this chapter explain that their statements and generalizations apply to the totally blind and "should be interpreted less rigidly in the case of the partially-sighted and in proportion to the amount of sight possessed by the individual." They assert that the blind have no more talent for music than the seeing, that they have no special power of concentration because of their blindness, and that they do not have to be taught by methods totally different from those employed in teaching the seeing. They further state that music is practically the only fine art in which the blind have been successful and that for this reason, it is emphasized more in schools for the blind than in other schools. In their opinion, all students may profitably take group singing, courses in the appreciation of music, and a certain amount of piano training; but only those with special ability in music should be encouraged to engage in advanced study of this art. The following is quoted from page 208 of the book:

> "The process by which the blind learn and memorize music is so cumbersome and time-consuming that it would seem that all except those with talent could use their time in other ways to better advantage. The handicap of blindness thus places the musician at a special disadvantage."

Another quotation bearing on this point may be given here:

> "If we examine the performances of the most brilliant blind musicians on record we discover that most of them show definite limitations."

The whole of chapter seventeen constitutes a clear and concise discussion of the value of vocal and instrumental music as a study and a vocation for the blind. Only those students with unusual talent are encouraged to study music with the intention of engaging in it as a vocation or profession. While this may be discouraging to some of our teachers, yet the writers of this chapter do not underrate the value of music for the blind, as can be seen from the following quotation:

> "But let it be said here that of all the subjects which the blind may study, music ranks very near the top—if not actually at the top—in importance and inspiration for both pupil and teacher. For its value in mental training, for its refining influence and character building, for its value in developing in the student the capacity to perform or appreciate music, all which things become his priceless possessions throughout life, music would seem to stand alone."

Readers of this book who are primarily interested in helping the blind to find employment are likely to feel somewhat pessimistic after reading Part Four, "Vocational and Prevocational Experiences." Naturally they would read this with the hope that vocations had been found in which the blind could be trained so that most of them should be able to earn an adequate livelihood. Courses in arts, crafts, and commerce are discussed; such as weaving, piano tuning and repairing, chair caning, basketry, knitting and sewing, sculpture, automobile mechanics, business law, typewriting, dictaphone and braille shorthand, agriculture and poultry farming. But no tangible evidence is presented to encourage the reader to believe that any of these can revolutionize the field of employment for the blind. A limited number of sightless persons have made and are earning a living in some of the vocations mentioned above, but too many of these arts and crafts seem to offer little or no opportunity to the totally blind for remunerative labor. How many totally blind men in the United States are employed as automobile mechanics?

As one carefully reads this book, he is likely to find here and there theories, methods, and courses of study which have little or no practical value in those schools which have a limited number of teachers and inadequate equipment, because their funds are insufficient to provide a wider field of training. The reader may contemplate as to whether or not the law of diminishing returns is operative in those schools showing a relatively large per

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Our Bookshelf

KATHRYN E. MAXFIELD, PH.D.

A PERUSAL of recent literature pertaining to work for the blind reveals the fact that here and there throughout the country classroom teachers have been doing some very interesting and constructive work on methods, course-content and the use of objective materials. Is it not time for the appointment by some national organization of a few committees of teachers that would function somewhat as did the General Science Committee of the A. A. I. B. of a few years ago?

That committee, after careful study and after practical testing of experiments and procedures in a number of cooperating schools, published *General Science: A One Year Course of Study Adapted for Use in Schools for the Blind,* in 1933. This monograph proved to have sufficient merit to win for the committee, Mr. J. H. Botts, Mrs. M. Genevieve Coville, Mr. Dale Hamilton, and Mr. Chester Gibson, chairman, notable recognition from the general field of science education as well as from their special field. However, this course was published eight years ago and undoubtedly it can stand revision and amplification. Would not the activities of another carefully chosen science committee result not only in bringing the course up to date but in stimulating science teachers in schools and classes for the blind throughout the country? Before dropping the subject of science we may add that a pamphlet designed for teachers of science to braille class children in the public schools might be helpful.

In the field of reading the last few years have seen an improvement in remedial techniques for the seeing as well as in methods of integrating the regular reading program with other school activities. It is high time that *The Blind Child and His Reading* be superseded or at least supplemented by a publication which would be the result of a careful study of new procedures, advisable adaptations or substitutions in techniques, and the development of original methods to meet the needs of children without sight. A specialist trained in experimental education and psychology, who knows the blind, working with a committee of teachers, should turn out a book that would be valuable.

Other areas could benefit by cooperative study, such as guidance and personnel, including but not limited to vocational guidance; music, covering such topics as the use of the radio and the Talking Book, and the present place of music braille; household arts for both girls and boys. Unless the committees were chosen with care, however, by someone in a position to visit widely in schools and classes for the blind, disparate elements might appear in the committee memberships which would limit the value of whatever material might be published.

A welcome addition to bibliographies on work for the blind is the *Index of the Proceedings of the American Association of Instructors of the Blind, for 1932 through 1940.* It will simplify the task of students having occasion to refer often to the Proceedings.

500 Books for Children, by Norah E. Beust, Specialist in School Libraries, U. S. Office of Education, can be most helpful to everyone having to do with blind children and their education, although it is not designed for use in this special area. (Bulletin, 1939, No. 11, published 1940. Superintendent of Documents, Washington, D. C., 15c.) This bibliography has been compiled in such a way as to give a cross section of the rich supply of reading matter available to children today. It is arranged in three sections representing grades one through three, four through six, and seven through eight; and the range of possible grades for each book has been noted. Brief annotations as to content, names of publishers, and prices are also given.

"Sound Photography"—A Hobby for the Blind

Robert O. Monaghan

The term "sound photography," which has come into general usage only recently, is heard with increasing frequency among blind "fans" who have become adept at making recordings of sound effects ranging from a professional vocal audition to an amateur "snapshot" of a factory whistle. Unlike picturemaking, which offers no interest whatever to those without vision, the somewhat similar process of recording sounds opens a broad field of opportunities to the blind person in search of an absorbing hobby or a helpful commercial aid. Because sound recording is new and has been undergoing extensive development by laboratory experts, it has heretofore presented financial and technical obstacles that made amateur experiments impractical. Now, however, after a period of more than ten years, the technicians have not only perfected details of the process but have designed equipment and parts that can be assembled with little difficulty and at nominal expense. The cost of record blanks must be considered too, of course, but the market now offers very serviceable blanks with a pasteboard base which have proved satisfactory and inexpensive for letters and less important recordings. The regular acetate blanks are higher in price, but are quite free from surface noise and afford a fine reproduction, especially of the higher frequencies.

It was only a year ago that I was able to find on the market a recording unit which I could afford to purchase, and which would give results equal to those obtained by the use of more expensive devices. The four-part unit consisted of an excellent radio, a recorder and a record player, both operating at the standard speed of 78 revolutions per minute, and a public address device designed to serve as an amplifier in small auditoriums and also to test voice volume and tone prior to recording. The recorder itself could be used to pick up radio programs as well as microphone sounds.

The unit as a whole proved to be very satisfactory, but I found I could not make use of all its features without the assistance of a seeing person. It was then that I decided upon certain experiments which, if successful, would make the operation of the machine possible for those without vision. Inasmuch as I was unable to see the electric eye provided for monitoring and regulating peaks in volume, I installed a jack and control for headphones which permits me to hear both radio and microphone programs as they are being recorded. Later, I began to take care of my correspondence, both business and personal, by sending audible letters prepared on the recorder. However, it was necessary in some instances to send records which could be played on a Talking Book turntable some of which revolve at only $33^{1}/_{3}$ revolutions per minute. I therefore reduced the speed of the recorder from 78 to 33 revolutions by merely removing the bushing from the motor shaft and driving the turntable with the shaft instead of with the bushing. This afforded the slower speed desired and was accomplished without any expense. At this recording speed I can get about ten minutes of conversation on one side of a ten-inch disc, and find this type of letter far more personal and effective than the customary inkprint or braille copy. It is much like talking by amateur shortwave radio, except that the mailing time has to be taken into consideration. In this manner I have even conducted business interviews which have proved as satisfactory as personal conversations.

This novel method led me to experiment with a two-way conversation system which now works with remarkable success at a

distance of about three hundred feet. This was made possible at a cost of only seventy-five cents by installing an old model magnetic speaker which can be switched into the microphone in-put channel and used as a microphone. This is merely a toy, but it furnishes all the amusement one could expect from a good plaything.

Audible letter writing had its disadvantages at first, for there were no facilities for making duplicate copies. This made it necessary for me to add another attachment to the recorder, so I installed a second jack into which I plugged a supplementary two-speed turntable and crystal pick-up. This allowed me to plug a record into the recorder instead of into the microphone and make a second recording of material on the original record. In the beginning I had a little trouble with frequency response, but that has been largely overcome and my copies are now turning out quite well.

Inasmuch as I am a teacher of voice and music history at the New York State School for the Blind, I realized that "sound photography" would be very helpful in my work. The record player was of immediate value, of course, in the teaching of harmony and music theory, and music history students were encouraged to study the recorded versions of selections which had been picked up from current radio programs. The greatest aid, however, was given to vocal students, all of whom showed remarkable improvement in voice training after listening to two or three recorded examples of their own singing. Because of the resonators which are in our heads, and which serve as sounding boards when we speak, we are unable to hear our own true vocal tones. When we hear our voice reproduced through the loud speaker, however, we can at once detect flaws in enunciation and inflection, and also the marring effects of improper tonal control. After practicing to overcome certain defects the students make new recordings of certain selections from time to time, thus keeping themselves informed as to the actual progress they are making. If they are in doubt about the interpretation of passages, the phrasing, or the exact pronunciation of a foreign word, they can easily compare their own recordings with records made by professional singers. In one or two instances, when students have been absent from school for a brief period, they have carried on their vocal studies by "audible correspondence," through the simple arrangement of sending in records of their exercises for criticism. In still other cases, records submitted by advanced students have been accepted in distant cities as professional auditions.

Very effective assistance has been given to the school's senior choir, to groups of younger singers, and to the band and orchestra, by making recordings which enabled them to hear the results of their own work. The recorder also has been extremely helpful to students of dramatics, and in most instances I have secured excellent recordings of group work by using only one microphone.

It is outside school hours, however, that "sound photography" has become for me a fascinating hobby bounded only by the limits of imagination. My record albums now include sound pictures of many of my friends, a talk with my mother, interviews with interesting persons who have visited the school, bird songs, the hum of an automobile motor, the blast of train and factory whistles, the roar of a storm in the night. There are always new experiments to be tried, improvements to be made, and, of course, new sounds to be recorded and added to the album of "snapshots."

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will realize that the possibilities for satisfactory and happy vocational adjustment are actually less promising for the mentally normal and superior blind child than for the type of child with which we are concerned. Supervised and subsidized employment in sheltered workshops, for instance, which characterizes the bulk of the employment offered to the

blind, can hardly provide gratifying outlets for the ambitions and wider interests of normal or superior blind persons. The mentally less fortunate individual, however, may find this type of employment satisfying and enjoyable.

Summarizing, we might say that our program would differ materially in three respects from that followed in the ordinary school for the blind today: first, in its restricted academic program; second, in its peculiar methodology; and third, in its distinctly shifted emphasis from academic to practical training.

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ing in the easy and natural use of hands, arms and body and this may be motivated and stimulated through directed action. Motivation toward good speech may also be brought about through participation in such a project.

The blind child needs direction in the use of leisure time. What better provision can be made for such time than to give him a vast store of ideas with which to work, a wealth of concrete images on which to dwell, a rich source of vivid and beautiful treasures with which he may fashion wholesome dreams and happy creations. These he can gain through the vivid re-creation of that material which he has received in the class in reading, history, literature or travel. Such experiences will more than pay for effort involved. Yes, creative dramatics pays large dividends to both teacher and student. It is indeed a powerful tool in the hands of the skillful teacher and in the hands of the receptive student.

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of the school. In every new educational movement, the question of balance must be considered. To carry the use of radio too far would be quite as unfortunate as to ignore it.

Research in audio-learning must be continued, but meanwhile, a willingness to experiment, an enthusiastic participation on the part of the teacher or leader, an insistence upon maintaining a balance between listening and other activities, the discernment to know when to impose control along with the ability to exert such control—all are necessary to the most effective use of radio in our residential schools for the blind.

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capita expenditure of money for training their students. But the thoughtful reader will find in the book a great deal of helpful and useful material based on sound and progressive principles and methods of teaching. Superintendents and principals of schools for the blind should encourage their teachers to investigate the contents of this useful volume.

The Teachers Forum

for

Instructors of Blind Children

Address all communications to

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The Editor will not be responsible for opinions expressed in signed articles

MARCH 1941

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What To Do for the Mentally Retarded Pupil

Ruth R. Hayden

In introducing the teacher of the visually handicapped and her work, it is customary to review the latest educational methods which she uses to assist her pupils to adjust themselves to the seeing society in which they live. It is usually assumed that the blind child and his teacher are working toward the same goal—to enable him to reach the general mental level on which the world moves. They are prepared to use the same equipment, to conform to the same terms, and to follow the instructions provided for the general public.

There is another phase of teaching, however, that we hear little about: the training of mentally retarded blind children, and the work of the home teacher with subnormal blind adults whose early training was neglected. Whether the pupil be a mentally subnormal child or an adult with little or no training, the rudimentary technique remains more or less the same; it must start with the most simple and elementary ideas and progress very slowly. The very first duty of the teacher, of course, is to make certain that the mentally retarded individual, whether he be five or fifty years of age, is freed from all physical and mental ills that may be cured by the physician, the surgeon, the psychiatrist, and the therapist. The condition of helplessness frequently remains unrelieved through neglect, because parents of a blind, mentally retarded child often do not understand the need for special training methods.

In any teaching process the fundamental requisite is a measure of mutual confidence between pupil and teacher, and in the case of the mentally retarded individual this confidence must be firmly established on a basis of faith and hope. Many persons believe that nothing can be done for the imbecilic child, but I cannot agree with this opinion. I believe —as a general principle—that any form of life can be improved through the civilizing medium of education. A teacher who has any doubt about this should not experiment with a fragile mentality. A reciprocal feeling of faith and confidence can be expressed by a subnormal child only in terms of liking. The less a child knows, the more necessary it is that he and his teacher like each other.

Having established some bond of kindly feeling through which you can communicate with a helpless pupil, the first task is to teach him to use his hands. If a child does not use his hands because he is backward, or because he is blind and does not know how hands should be used, then he needs the training that a wise teacher can give him. Help him to curl his fingers around one of yours, and then sway his hands, one at a time, in and out, left and right, up and down, but be sure that the motion of the two hands is always the same. Do not be concerned if he appears to be left-handed; probably he will outgrow this tendency when he finds the right hand more convenient to use. Watch for the first sign that he is moving your hand with his; when that point has been reached he is ready to try to hold objects. First, they should be small and soft and preferably long and narrow, such as a rag or rubber doll, a mitten, or a towel. Later, substitute hard objects such as an empty matchbox, a celluloid rattle, or a book.

From holding his own shoe and passing it to the one who is dressing him the child may progress to moving things from his lap to the table, or from the floor to the bed, or from one box into another. Encourage him to try again if he drops things, but check any attempts to throw things until he is compe-

tent enough to toss a ball in the desired direction. Bad habits, such as throwing, must be broken by the substitution of habits which give more satisfaction.

After a child can hold, move, and lift objects, he should be taught to hold things lightly, for the tendency is to grasp and squeeze both fragile and unbreakable things without distinction. After learning to handle delicate objects, a further step may be taken by introducing to him a dog or a cat, permitting him to stroke the animal gently.

While the child is being trained to use his hands, eye and ear training should also be begun. Very often a mentally retarded child does not see or hear simply because he does not know how to use his eyes and ears. Some stimulus is needed to arouse his interest, but if he has shown no response to his natural surroundings his curiosity may not be easily aroused by mechanical means. Here again it must be remembered that a backward child expresses his feelings in terms of liking, so if he is not blind or deaf it is probable that he will eventually respond to the personal interests of his teacher whom he has learned to trust.

To further a child's interest in hearing, he should be introduced to sounds that have some personal significance for him. If he likes eggnogs, he will enjoy the sound of the egg beater. Helpless children who are allowed to remain in bed, shut away from normal sounds of activity, often fail to learn because of lack of experience. The sound of the egg beater should be associated with and augment the taste experience. When the sound of coal being shoveled into the furnace can be heard, the child should be carried to the radiator, so that he may feel the warmth and comfort that give meaning to the sound. Make sure that he hears the sound of the motor and the opening and closing of car doors that precede an automobile ride. If he is wholly inattentive to natural noise, then try other sounds for his benefit, such as ringing a bell before you feed him.

What should a parent or teacher do with a child who has not begun to talk before he is three years old? In this, as in all such problems, patient persistence is the answer. Keep at it. If the child is not deaf, he probably babbles a little to himself. Listen carefully for the sounds he makes, then attempt to get him to repeat the sound after you, so that he may learn to connect a made sound, with a heard sound, thereby coordinating ear and voice. If the auditory method fails, the child should be trained to watch the lips of the speaker, and his hands should be placed against the face and throat to sense the voice vibrations. Even though his inability to hear is due to mental retardation rather than deafness, the vibrations may open up one more channel to his mind.

While it is desirable to set aside a definite time every day for each type of training, the teacher of a slow learning child must be an opportunist—always ready to seize the opportunity for an appropriate lesson. You may not have intended to fly kites today, but if the child's hat goes sailing off, or the leaves are whirling about, that is the moment to try to arouse interest in these things. It is always important that a lesson be in accord with the child's immediate need, mood or desire, and also that the task and the material be suited to the pupil's ability. A given type of development requires a parallel type of material, and later training depends to a great extent on the selection of proper material in the beginning. If a task is too easy the child will fall into slack habits and will lose interest very soon. If the work is too hard, the child will take no interest in it, and will form wasteful habits and a futile mental attitude.

When a child has progressed sufficiently to be trained by regular kindergarten methods, the teacher must have a complete kit of pegs, beads, lacing boards, blocks, and construction toys. If a pupil, young or old, is very retarded mentally, I usually start this training with pegs about four inches long, and beads about the size of an egg. When the handling of these objects becomes easy, counting should be added to the lesson, and this will also introduce eye,

ear, and speech training. During the process of learning, the retarded child may grasp, through physical experience, many ideas which he fails to understand through verbal instruction. For example, in stringing beads, he may say "up" when he lifts the bead, and "down" when it slides down the string. He may say "right" when he pushes the needle through, and "left" if he pushes the bead down with his left hand. If he is not totally blind, he can also learn colors, and even if he cannot see he can learn to identify round beads and square beads.

The base of a basket makes a very good lacing board for the mentally retarded child. This leads to the use of a sewing card after he has learned the principle of putting the lacing through one hole and then the next. A chair which has round or flat slats up the back makes a good weaving frame for long strips of colored cloth. Toy shops are rich in construction toys and creative material, and while the handicapped child may never be able to follow the instructions prepared for the normal individual, still he may gain both pleasure and profit from working with these objects. A peg board into which small pegs are to be pounded to make outlines of boats, cars, houses, and the like, may provide pastimes for those who are able to place the pegs in the holes, and a degree of education for those who have sufficient imagination to form straight lines or patterns with the pegs. Then there are sets of wooden pieces with which to construct a wagon or boat, with each piece designed to be used in only one way; these develop memory and reasoning power rather than imagination. Form puzzles, similar to the jigsaw type, serve a similar purpose.

Very often extreme retardation is due largely to a very limited background. Sometimes our pupils lack, not intelligence, but experience—primary experience upon which to build. During the normal baby's first two or three years he gets occasional, informal teaching by observing and naming objects and by getting his bearings in relation to matters of daily life. He must learn the difference between hot and cold, near and far, you and me, up and down, day and night, in and out, now and some other time. He must learn the likeness of the relationship between himself and his toys, to the relationship between his nurse or teacher and himself. He must know what things he can control, and what things he must obey. The normal child assimilates these lessons so quickly and easily that we scarcely realize we are teaching them. But the subnormal must be taught. A pupil of six or sixteen—who, let us imagine, has been kept in bed all his life—must begin a normal existence in a normal way—by accumulating rudimentary experience. With such a pupil, as with a baby, we must go about the house saying, "see the door, see the stove, see the clock on the shelf, see the moon in the sky," etc. Your pupil will learn more at first by being talked with, than in any other way. It may seem foolish to read nursery rhymes to a backward pupil fifteen years old. But it isn't foolish. The repetition of the same phrases, the singleness of ideas and the brevity of expression, make these old jingles quite the proper thing for a mind from three to six years in mental age. Without making a fetish of it, these rhymes might be illustrated; with a picture of Boy Blue, a real horn which the pupil can blow, a little black toy sheep, a cat or a fiddle, or whatever is easiest to have around and to handle regularly. If the child cannot talk, use one word in each rhyme, as: "toot" with Boy Blue; "baa baa" with the black sheep; and "spoon" with hi-diddle-diddle.

These objects, with many others, should not be left around for the pupil to play with. They should be kept for lesson time and used to teach, not to amuse. A good plan is to have a wooden box about two feet long and about ten inches wide and deep. In such a box I keep the objects we use for drill in recognition and in talking. In the collection I usually have: a top, a shoe, a boy-doll and a girl-doll, a spoon, a horn, an animal or two, a cup, a ball, and perhaps an auto that will go when wound up. These things of course

are very small. I show them day after day until the pupil begins to distinguish between them. Then I say: "Show me the ball," and I hope he will pick out the right thing. If the child is deaf, this makes a good lip-reading exercise. (In fact I got this idea from Miss Hall of the deaf-blind department at Perkins; and I was delighted to find how useful it is for children who are not deaf-blind, but only mentally retarded.) Later on, when your pupil knows many objects, it seems like a game to hide one and ask: "Is it the ball? Is it the top?"—and so on until he has named over half his stock—and then you guess right, so as not to tire him.

When the pupil knows the names of the common things he sees or handles, if he has sufficient vision, then it is time to show him pictures of single objects, such as animals, that are still outside his range of experience. If the child cannot say the animal's name, perhaps he can make the characteristic noise —"meow, bow-wow, moo," etc. The large animal silhouettes are good for this purpose, but I prefer the largest Bradley Toy Animals which stand up alone. This set comes with a farmyard fence, and standing the animals in the yard gives the child something to do. I do not use all the animals at once, but begin with one and add others as the pupil can recognize or name them. From a ten-cent store you can purchase simple models of a boat, a farmer, a windmill, a church—anything that might have interest or associations for your particular child. If he cannot name them, you must be on watch for something he can learn from each object. It would give his throat and lungs exercise as well as show recognition if, at the sight of the windmill, he should learn to puff and blow like a great wind. And if the pupil can talk, then you must tell him little stories and the principle facts about these pictures and models. Talk with him about going to church, or farming or boating. And read or recite poetry to him—Eugene Field, A. A. Milne, or even Edgar Guest, who uses a very homely vocabulary.

When the pupil knows the names of a dozen objects, he should start putting ideas into words. "Dogs bark. Blow horn. My red ball. Wooly sheep." The ideas need not be sentences at first. When you are ready to use sentences is the time to begin reading.

For the child who can see, I have a strip of heavy cardboard on which is printed in large letters, "I see a——." Using this as a pointer, I put it near the picture of a cat and have the child say, "I see a cat." Then I move it to some other object, and have the child say, "I see a boat," or whatever it may be. So he learns the written words just as if they were a picture, perhaps not even knowing that he has begun to read. If the child is blind, I write in braille a dozen lines of, "I see a" and put a different, easy word at the end of each line. At this time, or previously, I mark some objects in braille, and after the child has learned to recognize them by the shape, he may study the words and try to recognize each word when it is written in a sentence. In this work, always give most drill on what the child knows best, because that gives him pleasure and because the foundations must be learned beyond the possibility of doubt, chance, or forgetting.

If my pupils show a tendency to read parrot fashion without really recognizing the phrase "I see a," I change it to "Here is a" or "See the." I have all these phrases in very large type, obtained from an old school chart, but you can make them by cutting letters from the headlines in the daily papers.

To provide variety in the reading lesson I make generous use of all kinds of "flash cards." At first we use the color drill cards—about eight by six inches with a patch of color in the center and the name of the color in very large letters underneath. Also, there are alphabet cards, with the small and capital letter on one side, and the script letter on the other side. In showing these cards we give the sound (not the name) of each letter. These letters are so very large that even pupils who seem nearly blind may see them. But if your child cannot see flash cards, use alumi-

num alphabet sheets for the phonetic drill. It often happens that a child seems more nearly blind than he really is, and that improving his mind leads to marked improvement in his responses. There are two points about useful material that I should like to emphasize. First, use for your individual pupil the material that is provided for the whole class. For instance, a Beacon chart which hangs on the school wall for all the class, is printed in such large type that it can be seen at close range by a child with very little sight. Second, a great deal of material and equipment which is designed for physically handicapped children, is equally good for mentally handicapped children, even though they may not have physical ailments. For example: a clear type book, designed for the partially seeing, is much easier for a dull child to use than is the usual first grade primer. These two principles, applied constantly and with the widest possible range, will be a tremendous help to the backward pupil and to his teacher.

Most of my pupils, as well as I, myself, have such poor sight that we cannot get near enough to the large chart to all use it at the same time; but I have a braille copy, and my beginners, instead of using the wall chart from their seats, go close to it and get a foundation knowledge of reading. Unfortunately, there is no other reading matter in such large type. Many of my pupils who can see the chart cannot read clear type books. Even so, I think it is better to start with inkprint material, although they may have to take up braille later. One advantage is that the child feels more nearly normal and has a better spirit. Another advantage is getting drill on the same words in both print and braille. There are several sets of flash cards having common words in very large type, which we use also. I have them marked in braille for my own benefit, and if a child is totally blind I often let him use these flash cards for seatwork. I give the pupil a few cards to study, to copy in braille, to put into sentences, or to typewrite—according to his ability. In teaching braille writing to my pupils I usually have them write each letter in a line across the page, then follow this with a line of one easy word, then four lines of one word—to learn the spelling, and finally one line, or four lines of a sentence. Eventually we get to dictation, and to perfect copying; but we seldom get as far as composition, except the little required for very informal letter writing.

As for the course in reading which I pursue, it is about like this. We start with the single phrases and the chart and the flash cards, and then try a primer. For most beginners I use the *Newark Phonic Drills* and *Monroe's New Primer* embossed at the American Printing House, Louisville, Kentucky, (the primer can be purchased in inkprint from the American Book Co., New York, N. Y.). It is a very good book for children because each lesson is short and yet is really a complete story. Besides, the Monroe primer starts with easier wording than any other book with which I am familiar.

When my beginners get perhaps halfway through this little book, we leave it for awhile and start some other primer—usually *The Beacon Primer,* which is in both braille and print.

When the material in *The Beacon Primer* begins to get too difficult, I usually try the nursery rhymes in the Everyday Classics series, or in some child's story book. *The Story Hour Reader* is also very good and is in clear type, but not in braille.

Thus we go through the first part of several primers, and then return to the Monroe and go a little further in it. Unless the child has an unusual memory, we can review the first part of each book before going on. This is excellent drill. My youngsters read six or eight primers in the course of the first three years. When they are ready for more advanced reading we do not follow any one book, but read favorite stories from various books. Oftentimes I let a child read a book that is much too difficult for him, pronouncing and explaining all the hard words, if the story is interesting to him. I am not so proud

of developing a good reader as a wide-awake mind and a happy heart.

There are several good ways of awakening the subnormal mind to a sense of numbers and their meaning. Many persons who are not very bright in other respects, seem to have mathematical minds and others have a remarkable memory and can learn by rote all the number facts they will ever need. I have a pupil now, aged twelve, who cannot write his own first name of four letters, but he can write all the figures and can do twenty number combinations without help. With anagrams, or any such device, he does not always get the letters right side up; yet he can copy with pencil or chalk any simple number fact, and do it correctly. This boy is deaf, and I am basing his lessons chiefly on visual memory and his native flair for numbers. Visual and auditory memory are the very best channels through which to foster arithmetical ideas. I think it is not always necessary that the child understand a fact; let him take it on faith, or through habit, if he cannot get it any other way. So I count up to ten or twenty every day for months before I expect the pupils to try it. I have several grades in school at the same time, and we go through a regular routine of reciting the days of the week, the names of the months, the numbers, the seasons, the holidays, the multiplication tables —as far as the most advanced pupil needs them—and any other general information, along with our songs and poems and games and other lessons. My pupils always have some kind of handwork in their desks and are accustomed to take it up of their own accord when the general exercises do not concern them. Thus, while we are all singing nursery rhymes or counting or saying the alphabet, the brighter pupils are knitting or weaving; and when we get to the more difficult oral work the younger pupils get out their pegs and beads. Later, when the advanced students are reading aloud the little ones get help with their handwork. In order to carry on in this way, I have to show them how, rather than tell them, and that is a very good restriction, because very often verbal directions have no meaning, whereas pupils learn easily by being shown.

When a new pupil is ready to begin individual numberwork (beyond counting) I get out my biggest dominoes, the single numbers and blanks, as far as the child can count. We learn: 1 and 0 = 1, 2 and 0 = 2, and so on. Unless there is some special reason, I do not begin this work until the child can either write the figures on the blackboard or make them on the typeslate. When the child knows all the "nothings" we take the "ones"—1 and 1, 2 and 1, 3 and 1, etc. We say "and" for the raised line that divides the domino in the middle. The use of dominoes is by far the best method I have found for bringing the simplest ideas of number within the child's mental grasp. I have never taught a child to count on his fingers, and I do not like using blocks or jackstraws because the child may not understand why we must arrange them in groups before doing sums. In the case of the dominoes, the combinations are already arranged—they are facts to be dealt with. They lack the mystery of being created at the teacher's whim.

When we are ready for subtraction, we simply invert the process—write the sum at the top, take one number away, and have the other number left. By the time the pupil is far enough advanced to do multiplication he knows a few of the tables by rote, and we still use the dominoes for busywork, from one times one, to nine times nine. (I have never used them for division.)

From the J. L. Hammett Company you can get arithmetic material, with very black figures about two inches high, which the mentally retarded, nearly blind child will find very helpful. They are meant to be used by the teacher for the whole class to see, but of course the handicapped pupil must be able to look at them as closely and as often as he wishes.

It is not worthwhile for the subnormal pupil to go very far in arithmetic, unless it is a kind of game for him. But if he is up to

the third grade in other respects, he should be given a chance to master the four fundamental processes. The more he can do mentally, the better. Even if the numbers must be written, he should learn to add them three wide and three deep, to multiply by two figures, and to do short division. Also, he should be able to subtract even when it involves borrowing. In connection with subtraction I should like to suggest that the teacher should be very sure of her technique and always use the same expressions. The mentally retarded cannot always understand that "nine less six is three" if they have been taught that "six from nine is three." I think that some children may have gone to institutions for the feeble-minded because of complications like that which could have been avoided. If the teacher will choose one of those phrases and always use it, and never use the other expression, many failures will be prevented. Always give the top number first. Always say "less," never say "from," and your difficulty will not be half so great.

We all know the lengthy spiel about "Two less five I cannot say, so I borrow one from the zero, which leaves it nine—." This verbosity helps some pupils and muddles others, and it is up to the teacher to know what to do about it. If one method fails I try another, but my first choice is to say: "If the top number is smaller, add ten." Instead of saying "two less five" we start by saying "twelve less five." When we get to the next column, before the child has time to think about it, I say "It's one less because you borrowed." I always say this until the pupil gets accustomed to thinking "it's one less," and he never has to make a speech about it.

In the case of one of my pupils it took nine months to learn to write the number one, and less than half as long to learn eight more numbers. Some minds are like that—it takes long persistent effort to accomplish the first step, but you have little trouble afterward. Some minds are like sieves. They seem to receive everything while you are teaching it, but at once they forget all about it. Some minds are like sponges, retaining any impressions until stronger ones force them out.

The teachers who have been to a normal school will probably recognize the words: *primacy, recency, frequency,* and *intensity.* These represent methods through which you may plant a lesson in the pupil's mind. We all know the one-track mind that holds fast to its first idea on any subject. In such cases you must go straight to the point, teaching the pupil exactly what you want him to know, and not much else. You cannot teach him geography by travel stories and picture posters; you must give him the facts, in logical order, and in relation to, or at the same time with, their practical application to his daily life. There is a well-known story about a boy who swept the leaves into the wind, and never understood why they blew back over the walk. Here was a fine chance for a lesson on geographical directions and, since he could not reason about it, he would never forget facts once they had caught hold in his mind.

With the scatterbrained you follow the opposite process. Don't give them bare facts—their attention is caught by the frills. A boy, who had been in school since he was five, came to me at the age of twelve, doing poor first grade work. He couldn't get on with either teachers or pupils. He was irritable and restless, and had many bad habits. The teacher who passed him on to me, said "I defy anyone to teach him how to 'carry' in adding; he's so dumb!" With the advantage of a large schoolroom and few pupils, I lessened his irritability (and his chance of stealing) by giving him a seat apart. It was a pleasant seat by the window, which helped to lessen his restlessness also. I didn't try to teach him anything—that is, we didn't think about regular lessons—but I gave him easy things to do that would keep him out of mischief. His tasks included coloring, copying, winding thread from two spools on to one large spool, winding yarn, unraveling other children's poor knitting, leather lacing, typing (with two fingers) lists of three-letter

words for other children to read, copying numberwork where the answers were given, and many equally simple tasks. His mind and his hands flitted from one thing to the next. But every now and then he would astonish me with something that he had observed and remembered. He was with me a year and four months. He learned to add, even when it required carrying. He mastered easy subtraction, multiplication, and short division. He learned to write braille (for he will probably be blind eventually), he improved greatly in his reading of print as a result of copying print into braille, a process which required attention to each letter, and his general powers of observation and self-control were strengthened by a peaceful routine in which he felt he had a useful part. *Frequency* and *intensity* were the methods by which he learned and only after he had come in contact with the same fact many times was his mind open to receive it. In his case, coercion was useless. He absorbed knowledge when he was "good and ready," and if I wanted him to learn I had to let him do it in his own way.

In the long run we induce the pupils to conform to the common demands of civilized society; but at first we must abide by the pupil's requirements. A child who is dull and who is also emotionally unstable, will not conform. You must humor him. *Recency* is the method for him—you must suit your tactics to his mood at the moment. It makes no difference how kind you have been to him for he is the victim of his moods, and will do his work well one day and perhaps very badly the next day. If, on the "off" day, he chances to do something that amuses him, that seems to be a short-cut, or that appears to particularly annoy the teacher, he is likely to keep it up. Such a child does not thrive on the Montessori method: even though you let him "play around with pencil and paper" he will not "blossom into writing." He needs gentle, but ceaseless guidance. With *recency* ever in mind, you must keep him supplied with exactly the right lure at the right moment.

But the Montessori method has its place. One of our most recent pupils was a lad of nineteen, brought in from the backwoods. He couldn't even spell his name, and was promptly assumed to be an idiot. But the assumption was wrong. I have seldom had a nicer pupil. He is quiet, kindly, and studious. He was hydrocephalous and somewhat repulsive, and therefore had been neglected. And he has "blossomed into reading." He may not astonish the world, but he would astonish anyone who had known him two years ago. There were three difficulties about his reading. He felt and acted like a grown-up, but had no background for learning; he could see too much to enjoy reading braille, and too little to read print; and, worst of all, his hands perspired so much when he became nervous that the embossed print was unreadable afterward. So we tried it for two months, and then skipped it for five or six months; then tried again, and rested again. In the intervals we emphasized braille writing and phonetic spelling. Every day he writes lines and lines of words, usually those having some common element—belonging to the same word family, or relating to the same occupation, or taken from some familiar story, or all beginning with the same letter or ending with the same suffix, etc. The last time we tried reading he "blossomed out," and is now doing quite as well as if he had been plugging at it daily these last two years. *Primacy* and *intensity* fit his case. Of course, that does not mean that he can do without frequent drill. It only means that he holds the first idea if he gets it vividly enough, whereas, some hold only the last idea, until it is fixed by habit.

Despite these generalizations, we know that of our pupils no two are quite alike. The normal child may learn in spite of inferior methods, but the mentally retarded need good teachers, adequate equipment, patience, and well-considered and discerning guidance all along the way.

Teachers of mentally retarded children should profit greatly by a brief study of

training methods for the "adult child"—the subnormal individual who, through neglect, remains just as helpless at twenty-five or fifty as he was at ten. People of low mentality often live to a ripe old age because they have nothing to wear them out. They do not work, they are sheltered and protected, and they seldom go among the crowds where accidents and germs abound. If they have a family, they are far less of a burden economically than they are morally and socially. There is no way of estimating how tremendously the feeble-minded dependent person lowers the vitality of home life. The mother and father who may have loved the helpless child have scant courtesy for the helpless adult. Brothers and sisters who may have been kind about dressing and feeding their handicapped comrade, will not bother to continue this assistance. Often, the whole family is ashamed, and so enjoys no social life except after the subnormal member has been put to bed.

Such a person is both an adult and a child; in spite of his subnormal mentality he realizes that he is physically mature. He has acquired a few adult opinions; he has learned to expect certain privileges and to exert his own will in some instances; yet he is hopelessly inadequate to live up to any standard of maturity. Such a person will tell you that he is "free, white, and twenty-one," and that you have no right to ask him to go to bed at eight o'clock just because the neighbors are coming to play bridge. Or, again, such a person will insist that "everyone has a right to his own opinion," and will stick to his, no matter how absurd his point of view may be. As these persons develop, they learn little mannerisms and tricks of speech which are wholly incompatible with their limited knowledge and their need for care. Therefore, if life is to be made at all tolerable for them or for those about them, they must be taught. This is the one thought I have tried to emphasize throughout this article: Teach!

Regardless of the time required or the money spent, regardless of the ingenuity expended or of the seemingly small reward: Teach! At the time of the first World War, it was said that America was a nation of fifth-graders. A normal child is supposed to reach the fifth grade by the time he is ten. This is not a very high goal, and the subnormal pupil probably will never reach it. But if he could have five years of continuous training, and if he could be exposed to the common experiences of a normal child through its first ten years, he would certainly improve his personal status considerably.

The University of Iowa has, so far as I can learn, conducted the first authoritative investigations of the psychological theory that the I.Q. can be raised by education and environment. A teacher can do little to change a pupil's environment, but each single, little thing that she succeeds in teaching a pupil changes his mental status. Even our most successful teachers can think of things which they have not yet learned to do. I have studied piano for five years, under favorable conditions, and yet I have accomplished little. Is it really any wonder that the untrained mind cannot grasp the art of thinking, or cannot master average skill in talking, in five years? It certainly is not. When we teach our children a song or a poem that we have known for years, we think they learn slowly. But try teaching them something you don't know yourself: they won't seem half so slow, and you will have twice as much patience with them.

Take time to talk to your pupils. It is not sufficient to train the hands, eyes, ears, and tongue; we should also train the mind and heart. For this purpose the teacher has at her disposal a wealth of stories, poems, fables, songs, current events, and repartee. Very, very few are the subnormal persons who will ever earn more than the merest pittance. We cannot expect to make them economically independent, but we can teach them to *do* something as well as *be* something within the limits of their mentalities. We may not be able to make them very useful as members of society, but we can make them amiable, contented and cheerful.

DR. ALLEN SAYS:

A Semi-Centennial Celebration

Dear Pennsylvania Friends of the Past and the Present:

Since Mr. Cowgill has invited me here and now to reminisce aloud about certain personal experiences of half a century ago, I shall begin with a scene in my sickroom at home near Boston. The time is August, 1890. Enter, my mother introducing Mr. Cadwalader from Philadelphia, who has been authorized to engage me to head the institution for the blind there. He soon asks my age; and on hearing me say "twenty-nine," declares excitedly that had his Board supposed me so young they would not have considered me. But since it is now too late to look elsewhere I may come as acting principal and take charge under the guidance of retiring Principal Battles who will occupy the principal's house. Exit, Mr. Cadwalader, not any too happy in mind.

As for me I am so exultant that I speedily get well, obtain my release from Perkins and presently start for my new home, voyaging by sea all the way to Philadelphia and being deposited by cab at 20th and Race Streets. It would never have done for the new head of the institution to arrive by horsecar.

I was again in luck. Yes, my photograph, taken the previous winter, which had been shown by a friend to Mr. Cadwalader had got me the job. It pictured a man bearded and bald who was approaching forty!

Do you ask how I became interested in blind people? Well, the good fairy, who attended my coming-of-age party while I was still lame with a football knee, had had me cured by a physician who was blind. Then she had introduced me to a still more remarkable blind man, Dr. Campbell, who carried me off to London to teach in his select school for blind youth, where I promptly acquired high ideals regarding the standards that such young people could and should attain. Next she transferred me to be master of the boys' school at Perkins and, after two years, created for me the vacancy here. No such fortunate opportunity was to occur again at one of our three pioneer schools for a dozen years. Hadn't my fairy taken good care of me?

Let me now describe our venerable institution as it was in 1890,—the main purpose of my talk this evening. And, lest I seem to be over-critical, I shall say at once that this Pennsylvania Institution has had so creditable a past that when, in 1933, Principal Burritt, his staff and his pupils, reenacted its history in scenes on this Overbrook stage, both Principal Van Cleve from the New York Institute and I from the Massachusetts, agreed that yours had been the best of the three centenary celebrations.

However, by 1890 its old plant at 20th and Race Streets had long been city-bound. As its buildings had multiplied and its pupilage had increased to 190, its open grounds had decreased to about a single acre. Exercise space was therefore practically limited to house corridors, to a glass-enclosed piazza for the girls, and to the street sidewalks.

Mr. Chapin, who died in 1888, two years previously, had been principal some forty years. He was gentle and much beloved; had long since become, indeed, the indulgent father of his flock. Any capable pupil ready for discharge but with no home to go to might remain as a "resident assistant" or tutor, being paid a tiny monthly stipend, while many another oldster might stay to earn what he could through making salable brooms, brushes, rag carpet, or knitted, crocheted and fancy articles. Pupil "overwork" was not only allowed but encouraged, and paid for by a struggling department of manufactures and sales. Non-residents sent in their products to be sold. Indeed, the institution was largely a manufacturing establishment. For years,

about one-third of the whole pupilage had been overage, that is, adult—many being blinded men admitted to learn a trade. There were also several inmates of a home department. A cell called a smoke-house had been built in the wall down the yard and there any man might smoke and chew to his heart's content.

Mr. Chapin had been eager to have his supernumeraries cared for elsewhere, and had been active in the creation of the Working or Industrial Homes; also in a Retreat for the Aged and Infirm Blind. Do you wonder that his Managers of that period write of their school as an asylum? They made their annual official report to the Commissioners of Public Charities.

Even after these West Philadelphia homes had relieved the institution of most of its adults, many an old pupil continued to use it as a hotel while visiting the city; and even after I came, several asked for its hall in which to give their usual benefit concerts.

Now it was natural and expected that Mr. Battles, on becoming principal in 1888, should begin making salutary changes, such as admitting fewer and fewer adults and ever more and younger children; also as demanding that their parents clothe them, as the rules required. He told me that he had probably progressed too fast and too radically. Anyway, enemies arose, and in the spring of 1890 the Philadelphia Press fathered a public investigation during which even the young pupils were invited to testify. Doubtless many so enjoyed their novel importance and prominence. A group whose homes were in Western Pennsylvania presently ran away to become pupils at the opening of the new school in Pittsburgh. And finally when the atmosphere had brightened somewhat and Principal Battles had been fully cleared of all blame, he resigned saying that, since with him the blind had queered themselves, there was no sense in his remaining. Too bad! since the cause of the blind, your cause and mine, can ill afford to lose a single friend in this way.

Now to describe the plant itself. From the street the main structure appeared very well, but inside, all the nine buildings were rather drab and cheerless. The fact that everybody ate in the basement meant little; that was then the custom in institutions and even in many private Philadelphia houses. Only a few of our dormitories were multiple-bedded, and the older pupils roomed far away from the children. While there were enough schoolrooms, most were still furnished with crude benches instead of desks. Old Maggie's method of washing the floors was to pour soapy water over one section after another, then on hands and knees to mop up with a great towel. During one summer the Managers spent all of $4,000 letting light and air into dark and poorly ventilated spaces and in repairing, painting, and refreshing the buildings.

Some of you present this evening may remember Mrs. Roselle, the aged motherly matron whom I found presiding in 1890; also Mrs. Jones, the assistant matron in charge of the kitchen department. Both made it their chief concern to keep the household contented and happy; and they succeeded. The pupils' table was good and ample, and the teachers'—well, I had never lived so well before. Generally speaking my staff was interested and helpful. Even the pupils were active and well-meaning enough, though often much too noisy. But the school or literary department still suffered by comparison with the industrial department and with the department of music. While Principal Battles had instituted many reforms in it the class teachers labored without system or definite aim, for the school had not yet been graded. A curriculum existed of course but yearly advancement did not then lead to graduation by class but by individuals, and to honorable discharge. New York Point I found to be the official system of the literary department and braille that of the music department. Behold, a community unmotivated by any single controlling educational purpose. There was little school loyalty, a feeble *esprit de corps,* and a prevailing atmosphere of defeatism.

Mr. Battles, my practical mentor and

friend, wisely advised my studying conditions as they were until I could better them; and a Manager kindly cautioned me against all haste and reforming zeal. Meanwhile I took morning prayers, visited classes and shop often, mingled with the pupils at recesses until we had got mutually acquainted. Of course my new responsibilities weighed upon me; so much so indeed that for many weeks I never returned after an absence of an hour or two downtown without relief on finding the institution still there.

To illustrate one of my constant worries I shall quote from notes made at the time. You will perceive this story to be told in the Old English style of Mallory's *Morte D'Arthur:* "It fortuned that Sir Edward was sorely troubled of his pages that they chewed the weed tobacco, and would oftentimes have it privily in the mouth. Calling everybody into hall he reded the youngsters stop this practice—and told them why and what he should do. But still used were they to send one of their number to buy at a shop near by. Now on a day it befel that two pages went forth to church, and the name of one was Howard and of another Willy. When they were departed and wot well they were not watched, in all haste turned they out of the straight road and made for the shop where a dame passing ugly sold to man and boy. So when they had bought tobacco all that to them needed I wit well they did not tarry long but arrived up where the church was, even fast by the Square of Logan.

"When all had returned to the castle that hight P.I.B. much question was there of Howard by some pages howbeit he might harbor of the weed. But he said he had enough, else were he simple. And he privily gave of it to five, who being passing glad put some in their mouths. But anon came Sir Chafont de Bevan that way and he suspicioned something amiss, so quiet these pages held themselves when they heard him on his foot; for before they had made much noise and talk. They would have slunk away but Sir Chafont cried: 'What do ye here?' and they said: 'Nothing.' Therewith he took Willy and John and commanded: 'Arise, come with me!' And when he would have searched their mouths, behold they were empty. But Sir Chafont smelled their mouths and cried out so that it was frightful to hear, and terror seized their knees that they trembled marvelously; and they begged that he would spare them an they would tell him all. So they told of the shop wherein a dame sold tobacco and that Howard had that day bought and given fractions to five.

"Anon took them Sir Chafont to Sir Edward, Lord of the castle, who did rede them leave that custom. And he commanded that they be punished passing sore and tediously. Summoning his squire that hight Barton he commanded that he lead them an hour daily on his trip up and down all stairs and everywhere, until peradventure they should tire of it and renounce the weed. So, as Sir Edward commanded, was it done long and faithfully; and the pages were passing heavy and made much dole and sorrow. Yet would they not demand pardon but reviled and nursed their wrath. Howsomever, at the last they submitted and, coming unto Sir Edward, did him homage and obeisance, and said they would forego the weed while they were still pages in the castle; and they begged him trust them. 'I will well,' said Sir Edward, 'an it were better.' "

Evidently this experiment had worked; but alas, the said Sir Edward had later to resort to suspension—and on second offenses to expulsion. Once when he had recommended that extremity Mr. Fisher, chairman of our education committee, remarked sadly: "Of course discipline must be maintained, but don't you know, Mr. Allen, that each expulsion is an admission of failure on the part of the institution?" The question was not intended as a rebuke, but it did make me labor the more indefatigably to keep otherwise worthy boys at school.

For misdemeanors in general we had to do a lot of light punishing. Some of you may recall punching sheets of braille block-outs.

Since we realized, however, that the crowded conditions, with not enough of interest going on to fill in free time, were responsible for much unnecessary trouble, especially in the evenings, we cast about for more games and occupations out of class and introduced much additional and new educational busywork in class, such as tack drawing on cushions and clay modeling. Then came an inspiration! Why not bring about the habit of voluntary reading? My London pupils had been devourers of books, which fact kept them out of mischief. So, as soon as we had adopted American Braille, we opened a home printing office, where first Miss Sterling began the hammer-and-awl punching of plates of stories, then Mr. Bryan the embossing of an abundance of other fresh reading material; since the epoch-making stereotyper to do this by footpower had arrived by this time. For a reproducing press he used a strong clothes wringer, employing different boys to turn it. This created pupil participation in the book-making, and it paid both in money and in interest. Because everybody wanted to read the new stories as issued and filled much free time in doing so, the need for punishments fell off.

Ah, but what a further godsend that printing office was and continued to be! It provided all sorts of teaching aids—textbooks, paper desk maps, outline diagrams in great variety and form, almanacs, pieces for declamation, etc., even embossed examination papers, the first such, I believe, that had ever been used in a school of our sort. Within a few years we had as fine and full a set of textbooks and other embossed reading material as I had ever seen elsewhere, and a curriculum to correspond. For writing we bought braille paper by the ton. Supervised evening study hour became possible for the whole school at once. Meanwhile we had reorganized the literary department, gradually employing only new teachers of experience; and we put the boys' principal teacher in charge of their shop also. In short, a real school had been born—a thing which more than all else justified the Overbrook which was to follow. Indeed, this department quickly jumped to first place. And how our dear Mr. Wood welcomed this fact. It so encouraged him that soon after we had taken possession of our promised land he felt he could train his chorus to sing such classic concerts as no one else of us believed possible with our young people. Mendelssohn's *Hymn of Praise,* sung letter-perfect with Germania Orchestra accompaniment in Musical Fund Hall, presently so astonished all Philadelphia that we waked up the next morning to find ourselves famous.

Since at Overbrook we no longer needed to fill our boys' free time evenings with compulsory gymnasium work, how is it, I wonder, that I cannot now recall much, if any, punishment needed in the girls' school, even at Race Street? Doubtless Miss Dunning's close relationship with her pupils had prevented most troubles. Annie Hartman, a pupil of those days, tells me of the delightful times they used to have with parties, short excursions and what not; and other girls have spoken affectionately of our morning and evening prayers which were largely services of song—quiet hymn tunes which met the legitimate heart yearnings of the singers. It would seem that nowadays the urgent demand for time and efficiency have cut out the evening assembly and the Saturday's and Sunday morning's too. Mr. Wood used to claim that his years as pupil accompanist of the school singing had been one of his most rewarding preparations for church organ playing and practical musicianship in general, and the more of this the music pupils could have the better.

Of course there was always plenty of innocent mischief afloat. Among many pranks played at 20th and Race Streets, Elwood Govan reminds me that the boys once covered up the school skeleton in Bobby St. Clair's bed; and that on discovering it there he gave a wild shriek and put for the watchman, the ever faithful Matthew Loan.

Ah, those nine years of ours together at

the old institution! Yes, they were difficult years but they taught us a lot. I made many mistakes, of course, but profited from these more than from my successes. Did you know that the Managers had plans drawn for the needed new institution to be built on the old site, but that finally President Cadwalader persuaded the Board to buy adequate land in suburban Overbrook? Naturally the planning of the new plant there was a heavy responsibility for us all. Our beneficient expansion, as I like to call it, was largely the result of leaving behind in the city such conditions as experience had shown did not make for progress. We left there the regular monthly exhibitions, substituting for them a continuous exhibition of you pupils at your best. Thus you helped us towards carrying out the principle of perfection at all times. You also made the most of our ample outdoor space—something the old location had always lacked; and the reconstructed school displaced the outmoded smoke-house with playground apparatus, field sports and competitive track events. There we could not but grow alike in stature and in spirit. We developed, too, an *esprit de corps* together with school loyalty and dignity. All the world visited us and has continued to do so till this day. If imitation is the sincerest flattery, let me whisper to you that the excellences of Overbrook have been wisely copied and at great per capita expense —yes, even by those institutions whose heads had once declared that our and their attainable end hardly justified such ample means in plant and equipment, and such optimism.

What an inspiring thing it is for pupils and staff to live in a beautiful environment created expressly for them by an understanding Board of Management; to have strong and loyal graduate associations whose members love to get together to renew old acquaintances and times, and join again in the heartfelt singing of "Overbrook, dear Overbrook!"

My pulse quickens as I meet you again and recall days long past and the many persons who helped some things to run well and effectively even at the old Race Street site. Let me name some of these good people before Overbrook: Celia, at the front door; Michael Williams, everywhere; Mrs. Hutchinson, the motherly nurse; Mr. Hamilton, who later joined in every dance; Willard Hardman, our champion chess player; Mr. Geibel, the fertile composer; Mr. Ervin, tuning instructor; "Pop" Keller, your jovial bandmaster; Robert St. Clair, the versatile and reliable music supervisor; John O'Donnell, the stout engineer who one Sunday afternoon dashed upstairs and put out the fire which a delinquent boy had set in a dormitory bed; Mr. Linblad, boys' leader; Miss Sterling, who became our first librarian; Mr. Bryan, our record-making printer; and Mr. Wood, the revered master spirit of all. Then there were Miss Dunning, beloved by her girls; Miss Quinn, who taught the pupils to love all out-of-door life; the Misses Yeager and Ross, the Misses Cruser, Small and Hogg, also Miss Emma, the errand girl; Miss Lorimer, our staunch matron; Mrs. Barber, a kindergartner almost without parallel; Miss Rees, the ever helpful; and the Misses Sanford, Bingham, Paterson, Howard, Saunders, and McLaughlin. The spirit of every one of the departed among these we can fancy looking happily on us tonight in this forty-second year of our reconstruction. What a community of mutually helping friends we have all been, to be sure!

The Teachers Forum

for

Instructors of Blind Children

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The Editor will not be responsible for opinions expressed in signed articles

MAY, 1941

The Psychology of the Physically Handicapped—A Review

KATHRYN E. MAXFIELD, PH.D.

THE PSYCHOLOGY OF THE PHYSICALLY HANDICAPPED, by Rudolf Pintner, Jon Eisenson, and Mildred Stanton. F. S. Crofts and Company, New York, N. Y. 1941. 391 pp., $3.00.

For many years *the psychology of the physically handicapped* has been a familiar phrase in special education. Its meaning has been questioned and the wisdom of its use has been debated, sometimes with depth of feeling. However, since no better term has been found to cover the concepts, both vague and concrete, which people have in mind when they speak of the psychology of the physically handicapped, its use is not only practical but inevitable. As the authors of this book are careful to point out in their Preface, there is in one sense no special psychology of the physically handicapped since the same psychological mechanisms are involved in the case of the handicapped as in that of the normal.

Whether we like it or not the trend of the times is such that in city and state educational programs all of the physically handicapped will be placed under one head in the interest of economy and administrative efficiency. For this reason it is highly important that these administrators acquire a background of knowledge and understanding regarding the abilities and limitations of the handicapped groups, and that they be conscious of the psychological needs imposed upon each group by its particular physical defect. Very little is known about any of the groups; about some nothing is known, psychologically speaking. *The Psychology of the Physically Handicapped* is a long first step toward filling the need for a textbook which brings together what psychological information we do have under one cover. It can do much toward keeping administrators of special education reminded of *all* of the groups of the physically handicapped and that *all* groups need attention. It can also help to emphasize how widespread is the problem of physical defects and how tenuous are the boundaries of this area. Furthermore, throughout its chapters on the handicapped it forces the realization of how great is the need for more research.

Preceding the consideration of the handicapped groups themselves are four chapters which are designed to provide a general psychological setting for the rest of the book. These four are on Personality Development, Mental Hygiene, The Internal Mechanisms of Behavior, and Psychological Tests for the Physically Handicapped. They appear to presuppose little if any knowledge on these topics, but it is probable that they are written in this way as a result of the authors' experience with their own students. However, even for readers who are well-informed on present-day psychology a quick review of these pages would be worthwhile if only to set forth the point of view and introduce the vocabulary to be found in the pages that follow. Yet little use is made, in the later portions of the book, of the integrating possibilities inherent in this first section—except where the chapter on tests is concerned. It may be that this lack could have been cared for by a final synthesizing chapter which the book does not have.

From the point of view of the students of special education and psychology, for whom the book is written, *The Psychology of the Physically Handicapped* has many excellent features. It is well indexed, the type and line spacing are good, and there is no brightness of the paper to try the reader's eyes. Also, there are excellent bibliographies in

the compilation of which considerable care must have been used, and there are good summaries not only of the whole chapters but of parts of them.

The chapter on Psychological Tests for the Physically Handicapped is valuable not only to educators but to clinical psychologists as well. In it are listed most of the tests and scales which have been devised or adapted for use with the blind and the deaf, together with the names and addresses of the organizations from which the necessary materials can be purchased. No tests designed especially for use with the crippled have been listed for the simple reason that there are none to list. Whether the lack of tests in this field is due to the assumed applicability to this group of tests standardized for non-crippled children or whether it indicates a lack of psychological interest with regard to them, one cannot help wondering what a careful study of the crippled from the educational, developmental, and behavioral points of view would reveal. At present there are few if any tests adapted for use with the hard of hearing and the partially seeing. Although diagnostic tests have been devised for use with speech defectives, no mention is made of them here.

Incidentally, nothing is said anywhere in the book about the deaf-blind, who comprise a very small but psychologically most interesting group.

For the most part the material in the chapters devoted to the various handicapped groups comes under the headings Intelligence, Educational Achievement, Personality, and Special Abilities, with additional headings when available information warrants.

Throughout the chapter on The Deaf the overwhelming importance of the language handicap is manifest. Left to himself, the intelligent deaf child does succeed in making his concrete, immediate needs understood fairly adequately, through the use of signs. However, since the sign language can never meet the language requirements of the present-day world in which complex and abstract ideas must be conveyed from person to person through speech and through the printed word, the deaf child is forced to spend much of his life in the laborious acquisition of what is for him a second language. Present knowledge of the deaf indicates that their motor and mechanical ability and their concrete intelligence are their chief assets, as a group; their abstract intelligence and their academic achievement their great liabilities. Because of this, Dr. Pintner, who writes this chapter, asks if it is not time to reorient their whole educational program so as to center it around the concrete and the mechanical, making the learning of language "subsidiary and ancillary to making and building and doing."

Where deaf children are concerned Dr. Pintner is urging an educational viewpoint which is equally important in the education of the blind, and that is that each deaf person be given an opportunity to become a well-adjusted *individual,* each with his own personality, and that he be given no encouragement to become a pale imitation of a hearing person.

Suggestions for future research with the deaf cover such vitally important topics as the relationship between the learning of speech and lip-reading and a wholesome personality, especially in the case of the mentally retarded; the effect upon the deaf person's personality of the unavoidable adaptations he must make to a hearing world; a further search for fields in which the deaf might be especially competent vocationally; and the developmental needs of the deaf preschool child. It is urged that each school for the deaf have a school psychologist and counselor and that a cumulative record card be kept for each child. Such provisions would go far toward insuring that every pupil would continue to be looked upon as an individual with his own abilities and disabilities in whose life pattern deafness was only one factor, albeit a most important one.

In the chapter on The Blind, attention is called to the fact that because of the obvi-

ousness of his handicap the blind man attracted the interest of philosophers and scientists as well as the lay public long before any thought was given to the lot of the deaf. Indeed, even today people who should know better are to be found who react toward the deaf man as though he were "dumb" instead of deaf.

In the psychology of blindness such problems as space perception, the "sixth sense" or "facial vision," and the possibilities of compensation received early attention and are by no means forgotten in the present. They are not forgotten because they continue to be unsolved problems. Answers to some of the questions relating to space perception and the "obstacle sense" are seriously needed and these problems should be subjected to prolonged research by some psychologist who is a careful worker and possessed of insight and imagination.

So far as intelligence is concerned the blind are found to cover the same range as the seeing although the distribution curve is somewhat weighted at the lower end. Hayes' standardization of the Binet test remains the outstanding contribution in the field of mental tests for the blind, although other useful scales have been adapted or devised. A number of educational tests are available for use with the blind and in this field also Dr. Hayes has taken the lead. On the whole the blind are often up to or even beyond the norms for the seeing in tests on school subjects when grade norms are considered, but they are usually below in terms of norms based on chronological age. Comment is made in this book upon the fact that although experimental work has been begun on the process of braille reading more work would be desirable. When it comes to studies of personality little has been done with the blind; nor have special abilities and disabalities received the attention they merit.

A number of interesting studies are mentioned in this chapter which are somewhat out of the usual line of experimental work with the blind and which may be well worth further consideration. Such, for instance, is the study by Cantril and Allport, a report of which appears in their book on *The Psychology of Radio* (Harper and Bros., New York, N. Y., 1935) in which they report on the ability of forty-two blind and thirty-three seeing students to interpret the voices of strangers with regard to vocation, age, ascendancy-submission, introversion-extraversion, interests, and so forth.

With regard to the hard of hearing there seem to be only minor differences between them and those with normal hearing, although they seem to be somewhat more retarded in school and are not quite so well adjusted, as a group, as are their normal schoolmates. The differences are small yet the hearing defect may become the focus at which personal problems are concentrated, especially in the case of children who have a sudden and marked diminution in hearing during adolescence. For this group training in lip-reading and the proper use of hearing aids are most important.

As far as the partially sighted are concerned the extent of our ignorance regarding their special needs, abilities, and problems is pointed out. Until very recently the first concern in sight-saving classes has been with questions relating to lighting, equipment, administration and so forth, but the time has come when the personality problems which may be imposed upon these children by the presence of their visual defect might well be given attention.

Although the introductory chapters of the book appear to assume considerable naivete regarding psychological terminology, in the chapters on the hard of hearing and the partially seeing terms such as *decibles of hearing, 9 S.U. of hearing loss, 20/200 vision,* and *S.D.* are used without explanation. However, this is a minor point and can be easily corrected in another edition.

The crippled are as yet an almost unstudied group, psychologically and educationally speaking. It is a most important

group, however, and will most certainly be given the consideration it merits some day. However, the physical problems of the crippled are so demanding that they have of necessity been given attention first. Such psychological studies as have been made indicate that the crippled as a group are somewhat retarded in intelligence, with the poliomyelitis cases being somewhat more superior than the others; and that there are many occupations in which crippled people may succeed.

A chapter headed Other Physically Handicapped Groups covers what little work has been done on the allergic, the cardiac, the diabetic, the encephalitic, the epileptic, the malnourished, and the tuberculous.

Two chapters are given to speech, the first to The Defective in Speech and the second to Speech Involvements of Special Types of the Physically Handicapped. The first gives an excellent background of speech terminology and provides a general grasp of speech problems as found in the general population. The second deals with speech defects as found among the blind, the spastic, the choreatic, and the deaf. Although the reviewer feels inclined to disagree with some of the statements made here in connection with the blind, she refrains from doing so for the simple reason that her own judgments would have to be based on personal opinion as she suspects some of Dr. Eisenson's are. So little careful research has been done on this subject, aside from that of Stinchfield and Fladeland, that general impressions can bulk more largely in our judgments than we realize.

Psychologists and educators dealing with the physically handicapped have Doctors Pintner, Eisenson, and Stanton to thank for a most interesting and necessary book in their Psychology of the Physically Handicapped. It is to be hoped that the need for further research will be brought home to those who can make such research possible and that the proper persons will be found to carry it out.

The Curriculum

A Study of the Curriculum for Residential Schools for the Blind, by Neal F. Quimby. American Foundation for the Blind, New York, N. Y., 1940. 220 pp., $2.00.

A Study of the Curriculum for Residential Schools for the Blind is a thesis which was submitted by Dr. Neal F. Quimby in partial fulfillment of the requirements for the degree of Doctor of Education at Temple University. It is a book of 220 pages, divided into thirteen chapters.

Chapter I deals with the problem and scope of this particular study and mentions several worth-while contributions made by other writers in the field of the education of the blind.

Chapter II gives an excellent résumé of the history and development of the curriculum in schools for the blind, beginning with the early European schools for the blind and bringing us up to date to the period 1938. The material quoted in this chapter is most concise and exceedingly well chosen.

Chapter III is a study of typical problems in the education of the blind. This is followed by seven chapters which deal with the curricula of the schools from kindergarten through high school, and the special fields of music, physical education and manual arts. These chapters are full of tables, which, if one will take the time to study them, contain information not only of interest, but at times rather surprising in content. The many ways in which the schools vary is illuminating and should give us food for thought.

Chapter XI is very short. It gives us a summary of the economic status of the blind, and, as we all know, the field of employment seems to be somewhat limited although some twenty-seven occupations are listed.

Chapter XII covers five pages of summary, and is followed by a chapter of recommendations. Dr. Quimby believes that schools for the blind are attempting to teach too much and suggests there should be a change in philosophy involving a reorganization. An

adequate program for the backward, as well as for the superior child, is needed. Guidance should be more than "lip service." The author has made a number of suggestions for further study, many of which are well worth adopting.

Dr. Quimby is to be congratulated upon having had such excellent cooperation from schools for the blind. The response which he received to his voluminous questionnaires was excellent, and it was only through this cooperation that the writing of this book was made possible. Now that the results are published, let us hope they will be studied by the school authorities.—*Francis M. Andrews.*

DRAMATIC ARTS PROJECT

DURING the winter and spring the Foundation has been giving considerable attention to the furthering of instruction in dramatic arts in schools for the blind. A grant from the Rockefeller Foundation has made it possible to send three dramatic coaches to eleven schools for the blind since the first of January. These coaches have given groups of teachers instructions in play production and have supervised the coaching of two plays in each of the schools visited. It is planned to continue this project during the coming school year and numerous requests for this gratuitous service have been received. The coaches have spent five weeks in each of the following schools—Iowa, Wisconsin, North Dakota, Washington, Oregon, California, Arizona, Tennessee, West Virginia and the two schools in Louisiana, and one of them stopped for a few days at the Pittsburgh school where a play was already in the course of preparation. In a preliminary project two of these coaches visited the Maryland, Ohio, and Minnesota schools two years ago and directed the production of a play at each of them.

The plays which have been presented are: The Happy Man, Bunty Pulls The Strings, The Weeshy Man, Charm, The Musical Box, The Apple of Contentment, The Late Christopher Bean, What A Life, Snow-White and The Dwarfs, The Comedy of Errors, The King Who Could Not Laugh, Cinderella, Skidding, Broken Dishes, Not So Long Ago, The Knave of Hearts, The Sleeping Beauty, Dulcy, Ten Minutes By The Clock, and Little Women.

The parts for the different characters in these plays have been brailled and bound in separate booklets and may be borrowed from the Foundation library. Prompt books have also been prepared, showing any changes in the lines and giving directions to the producer and actors in regard to adaptations of stage movements and lighting and property plots to small stages. Arrangements were made with the copyright holders for reduced royalties on plays used in connection with this project.

Our Contributors

The article "What To Do for the Mentally Retarded Pupil" is by Miss Ruth R. Hayden who is a teacher at the Tewksbury State Hospital, Tewksbury, Massachusetts. It is a condensation of part of a series of articles which appeared in braille in *The Home Teacher* and, although not prepared especially for teachers in schools for the blind, contains considerable material which should be suggestive and valuable to some of them.

Dr. Allen's article is an address which was delivered on the occasion of the presentation of a bas-relief commemorating his becoming principal of the Pennsylvania Institution for the Instruction of the Blind. Although prepared with a special audience in mind it is interesting to anyone who wishes to know more about the history of the education of the blind.

Dr. Maxfield calls attention to one of the best books which have appeared in its special field and Mr. Andrews reviews Dr. Quimby's thesis, for which most of the superintendents of the schools for the blind contributed material and in which they and their teachers will be much interested.

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Stanford Achievement Tests for the Blind: New and Old

Samuel P. Hayes, Ph.D.

A 1940 revision of the Stanford Achievement Tests was advertised last winter and two new forms of the test, D and E, are now being distributed by the World Book Company, the publishers. Therefore, teachers in schools for the blind are naturally wondering whether they should forsake the old for the new, and how soon the new will be available in braille. This article attempts to answer both questions. The test material for Form D has already been sent to the American Printing House with the expectation that it will be available for use early this fall and in this article directions for giving the new forms will be presented. However, proof will be offered to show that it is not necessary to discard the earlier edition. It has given excellent results in nine schools and we now have average scores for the blind which may be used as tentative norms in schools for the blind; and since the authors have published tables for converting scores on the old tests into scores on the new, we can consider that we shall have ten forms in place of five, and may give a Stanford Achievement Test each year for ten years, or twice a year for five.

A Brief History of the Stanford Achievement Tests

The original battery of tests, forms A and B, was published in 1923. It included tests in eight different subjects, which were available both as separate tests and as a composite battery. Forms A and B were standardized and equated on the basis of the scores of 1500 pupils. Six hundred and sixty-six items were included in each form, selected from approximately 5000 items originally chosen from previous tests constructed by the authors and from analyses of textbooks and studies of subject difficulties.

The norms for forms A and B were revised in 1925 on the basis of a carefully selected representative sampling of 2000 cases from a much larger number of elementary school pupils in twenty-four cities and districts in the United States. A thorough revision of the tests was completed in 1929, resulting in forms V, W, X, Y and Z. Various changes and extensions were later made in these forms, which were equated to forms A and B on the basis of test results with 5000 pupils.

After forms V, W, X, Y and Z had been in use for approximately ten years, certain considerations made it seem desirable once more to revise the Stanford Achievement Tests. Through repeated use, the old forms were becoming too familiar to teachers and pupils in some communities so that it appeared necessary to replace these old forms with new material; changing trends in curricula and newer emphases in education necessitated certain other changes; finally, recent developments in testing technique made it possible to produce tests which represent a considerable improvement over the older forms, particularly from the standpoint of ease of administration and scoring.

In the 1940 revision the resources of the Library of Congress and of the library of the Office of Education have been fully utilized in making an analysis of curricula, courses of study, and textbooks. Several thousand items were constructed covering the material judged to be most important on the basis of this analysis. These items were then evaluated by subject-matter specialists and the best ones were selected for the first experimental edition of the test. All the material in the previous forms of the Stanford Achievement Tests was carefully scrutinized to see how

much of it ought to be retained for fresh tryout in the new forms; of all the material tried out for the 1940 revision, approximately one fifth was drawn from the old forms. Sufficient material was tried out in the preliminary program to provide five new forms of three batteries: Primary, Intermediate, and Advanced. These experimental forms were administered to pupils in grades two through ten in communities representing a wide variety of economic and social backgrounds and constituting a nationwide geographic sampling. More than 200 children at each grade level took each form of the test. For every item the responses of all the children were tabulated and the per cent of the pupils passing the item at each grade level determined. On the basis of this item analysis it was possible to eliminate such items as failed to show an increase in per cent passing from grade to grade and to remove ambiguous and otherwise unsatisfactory items. The items which were finally retained were then divided into five forms (designated Forms D, E, F, G and H), balanced in difficulty and content. Care was taken to insure that each form represents an adequate sampling of the content in each of the subject-matter areas. As a further check upon the equivalence of the new forms, further experimentation was carried on, involving the administration of the five forms to equated groups, approximately 1600 pupils per grade. Finally, in order to establish norms for the new tests, approximately 300,000 pupils in 214 administrative units were tested. As the authors say, it is obviously impossible to establish national norms by testing all elementary school pupils throughout the country, but we can easily credit their belief that the sample on which the norms of the Stanford Achievement Tests are based represents a more adequate sample of the national elementary school population than has heretofore been obtained for any test, either intelligence or achievement. Their pupils represent 173 communities in 32 states. In each community at least three consecutive grades were tested; in 70 communities all grades from two through nine were tested.

The Use of the Stanford Achievement Tests in Schools for the Blind

After preliminary trials at Perkins Institution in 1933-34, and a careful checkup of results, the regular annual use of the Stanford Achievement Tests was begun in the school year 1935-36 at Perkins Institution in the fall, and at the New York Institute for the Education of the Blind in the spring. At Perkins Institution, Forms X, Y, Z, V, W and X have been used in that order; at the New York Institute and the Ohio State School four forms have been used; at the Pennsylvania Institution for the Instruction of the Blind three forms have been used; and at the Iowa School, the West Virginia School, the Indiana School, the New York State School and the Tennessee School one form has been used. The results of all this testing have been sent to the writer and form the basis for the figures that follow. Various other schools have used parts or the whole of the test, but have not reported their results. Table I gives the results of the nine schools reporting, arranged in graphic and tabular form. In order to put all the schools on approximately the same basis, the results of the first testing in each school were used; as the different forms were carefully equated by the authors, and show a similarly high equivalence when used with the blind, it seems reasonable to overlook the fact that different forms of the test were used at the first testing in different schools.

At first glance it is obvious that in every test there is a fairly regular increase in average score from grade to grade. Then it should be noted that the average scores printed below the graphs are very similar to the seeing norms printed below them, so similar that a graph of the seeing norms takes practically the same course as the graph of average scores, except in tests 5, 7 and 10. In these three tests we find the blind testing just about

TABLE I

Results of Stanford Achievement Tests

FORMS V, W, X, Y, AND Z

WITH MORE THAN 600 PUPILS IN NINE SCHOOLS FOR THE BLIND

(First Testing in Each School, 1935-1940)

Grades....	4	5	6	7	8	9	4	5	6	7	8	9
	1. PARAGRAPH MEANING						2. WORD MEANING					
No. Tested	104.	119.	100.	104.	104.	95.	103.	119.	106.	103.	101.	86.
Av. Score	55.1	68.9	78.9	80.5	86.9	96.5	61.	72.6	78.5	86.	92.2	96.6
See'g Norms	55.	67.	78.	85.	92.	98.	55.	67.	78.	85.	92.	98.
% of Norm	100.	102.	101.	95.	97.	98.	111.	108.	101.	101.	100.	98.

Grades....	4	5	6	7	8	9	4	5	6	7	8	9
	3. DICTATION (Spelling)						4. LANGUAGE USAGE					
No. Tested	99.	119.	102.	101.	103.	85.	99.	120.	107.	104.	104.	88.
Av. Score	60.6	66.1	78.6	87.9	90.9	97.8	50.6	64.1	79.1	91.8	95.1	102.9
See'g Norms	55.	67.	78.	85.	92.	98.	55.	67.	78.	85.	92.	98.
% of Norm	110.	99.	101.	103.	98.	99.	92.	96.	101.	108.	103.	105.

Grades....	4	5	6	7	8	9	4	5	6	7	8	9
Av. Score	5. LITERATURE						6. HISTORY AND CIVICS					
110												
100												
90												
80												
70												
60												
50												
No. Tested	99.	120.	108.	104.	105.	87.	97.	120.	107.	101.	105.	85.
Av. Score	49.7	62.7	69.2	82.1	80.	90.4	49.6	64.8	76.4	87.9	94.	98.6
See'g Norms	55.	67.	78.	85.	92.	98.	55.	67.	78.	85.	92.	98.
% of Norm	91.	94.	90.	96.	87.	92.	90.	97.	98.	103.	102.	100.

Grades....	4	5	6	7	8	9	4	5	6	7	8	9
Av. Score	7. GEOGRAPHY						8. PHYSIOLOGY AND HYGIENE					
110												
100												
90												
80												
70												
60												
50												
No. Tested	100.	121.	106.	103.	106.	91	102.	119.	106.	103.	105.	87.
Av. Score	55.7	72.8	85.1	91.1	98.1	94.9	59.4	72.4	79.3	84.9	92.3	98.1
See'g Norms	55.	67.	78.	85.	92.	98.	55.	67.	78.	85.	92.	98.
% of Norm	101.	109.	109.	107.	106.	97.	108.	108.	101.	99.	100.	100.

Grades....	4	5	6	7	8	9	4	5	6	7	8	9
Av. Score	9. ARITHMETIC REASONING						10. ARITHMETIC COMPUTATION					
110												
100												
90												
80												
70												
60												
50												
40												
No. Tested	103.	104.	95.	89.	97.	80.	101	102.	93.	87.	95.	78.
Av. Score	58.9	72.6	80.5	89.9	92.6	96.8	44.4	53.9	62.5	68.1	73.9	78.9
See'g Norms	55.	67.	78.	85.	92.	98.	55.	67.	78.	85.	92.	98.
% of Norm	107.	108.	103.	106.	100.	99.	80.	81.	81.	80.	81.	80.

as much above the seeing in geography as they test below in literature; while the relatively great inferiority of the blind in arithmetical computation may be attributed partly to the mechanics of testing and partly to the introduction of mathematical processes which are not stressed in schools for the blind. A special study is being made of the parallel test in the new Form D to make it more suitable for use with the blind. Finally it should be noted that this table is based on the results of about 100 pupils in each grade, making a total of about 600; and as these pupils are in schools in widely different parts of the country, they may be considered a reasonably representative sample of blind school children. For the present these average scores may be taken as grade norms, and the graphs used for school comparisons. This can be simply done by tracing these graphs upon a thin piece of paper and charting the graphs for a new school on top of these.

Table II gives the average scores by school subject at Perkins Institution. This table is based upon the first testing of each of the pupils tested in grades four to nine from 1935 to 1940. The subjects have been arranged in order from best to poorest average score and this table may be taken to indicate the relative success of the school in each subject, in so far as the test covers the content of the subject as taught in this school. We have already referred to the inadequacy of test 10, Arithmetic Computation, which naturally gives an average score decidedly below that in the other subjects. A further study of the 185 pupils involved in these calculations shows that they have an average chronological age of 13 years, 5 months, *SD* 2 years, 7 months; an average mental age of 13 years, 7½ months, *SD* 2 years, 8 months; and an average *IQ* of 105, *SD* 16.66. Their scores in the Stanford Achievement Tests indicate a grade retardation of about two years, which is just about what is to be expected in a school for the blind. These average scores, based on six years of testing, may be used to check up the results of first tests in other schools.

TABLE II

AVERAGE SCORES BY SCHOOL SUBJECT AT PERKINS INSTITUTION

(First test of each pupil, 1935-40)

Test number and subject	Number tested	Average score	S. D.
4. Language Usage.....	181	74.10	30.48
8. Physiology and Hygiene.....	180	72.72	19.75
7. Geography.....	179	72.67	19.67
3. Dictation (Spelling)...	174	72.33	15.44
1. and 2. Reading.....	174	70.20	21.65
9. Arithmetic Reasoning..	179	68.80	21.94
5. Literature.....	175	67.79	20.88
6. History and Civics....	175	63.27	25.37
10. Arithmetic Computation.....	181	50.26	18.89
Average and S. D. of total scores on ten tests.....	181	675.45	202.05

Reliability and Validity of the Stanford Achievement Tests

In considering whether a test is worthy of use, it is customary to require some data to indicate its reliability—the accuracy with which it works; and its validity—the assurance that it measures what it is supposed to measure. If the different forms of the test are really equal, we should expect that pupils who are high on one would be high on the others, i.e., we should get about the same ranking of pupils whichever form we use. As different forms of the test have been used each year for six years at Perkins Institution we may then get some indication of the reliability of the test by making correlations of the scores of all the pupils tested in succeeding years. Table III gives these results. As all the correlations are in the nineties we may say that this test has very high reliability. We have also made a few correlations of single subjects within single grades. These correlations run lower—from .70 to .85—but considering the small number of pupils involved when single grades are studied, these correlations compare favorably with the subject-grade correlations published for the seeing.

We may gain some idea of the validity of achievement tests by comparing the pupils' scores with their teachers' estimates of their

TABLE III

PRODUCT MOMENT CORRELATIONS OF TOTAL SCORES ON RETEST AT PERKINS INSTITUTION (GRADES 4–9 COMBINED)

Year	Form used	Year	Form used	Number tested	Cor.r	PE
1935	X	1936	Y	69	.93	.011
1936	Y	1937	Z	45	.96	.007
1937	Z	1938	V	43	.92	.016
1938	V	1939	W	49	.94	.012
1939	W	1940	X	59	.94	.027

ability, for good pupils should do well on the tests and poor pupils should get lower scores. At Perkins Institution we made this comparison the first year of testing, 1935-36, in spelling, geography and arithmetic and the results justified the continuance of testing. In spelling our rank order correlations ranged from .85 to .71 for five of the grades while the correlation for grade eight fell to .44. These correlations are fairly satisfactory considering the small numbers involved in a grade and the uncertainty of teachers' marks for a year's work. In geography and arithmetic we found correlations from .62 to .71 in the fourth grade and from .35 to .49 in the seventh grade. The results for the West Virginia School were studied by correlating teachers' marks with an efficiency quotient obtained by dividing each pupil's score by the norm for his grade, treating the whole school as one group. From thirty to fifty pupils took each test. The rank order correlations follow from best to poorest: Spelling .82; History .66; Arithmetic Reasoning .62; Language Usage .55; Geography .50; and Physiology .30.

A second measure of validity is the correlation of the achievement test with standard intelligence tests, for again we should expect bright pupils to test high in school subjects and dull pupils to test low. Moreover we might expect higher correlations than we get with teachers' marks since the latter are so likely to be influenced by subjective factors. Table IV gives these correlations for the first test in each of four schools, and for all the pupils tested at Perkins from 1935-40 at their first testing. It will be noted that these correlations are uniformly high. A further indication of the validity of the Stanford Achievement Tests comes from a correlation of all those tested with the Wechsler Adult Intelligence Test in 1940-41 and their last total score on the achievement test divided by the norm for their age. For the seventy-four thus tested we found a product moment correlation of .70, *PE* .0401.

Interrelations Between Subject Tests in the Stanford Achievement Tests

A further check upon the adequacy of a battery of tests is obtained by finding out how closely one test correlates with another. Although we expect bright pupils to test high in all the tests unless some particular subject has been neglected, we are prepared to find that some of them test higher in one subject than in another. Table VI gives a collection of intercorrelations between tests, obtained from the results of the first year of testing in two schools. To assist in the interpretation of these figures, as well as the correlations already reported, Table V and a few paragraphs from Woodworth's *Psychology,* 1940 edition, pages 69 ff., are presented. "Even

TABLE IV

PRODUCT MOMENT CORRELATIONS OF MENTAL AGE ON HAYES-BINET TEST WITH TOTAL SCORE IN STANFORD ACHIEVEMENT TESTS, AT FIRST TESTING

School	Year	Form used	Number tested	Cor.r	PE
Perkins Institution	1935	X	103	.83	.021
New York Institute	1936		76	.75	.0034
Pennsylvania Institution	1938	Z	96	.83	.021
New York State School	1939	Y	69	.95	.008
Perkins Institution	1935–40	All	184	.91	.0086

though one has no occasion to compute correlations, one runs across correlations of .50 or of .80 in general reading and needs a realistic sense of the closeness of correspondence indicated by such numbers. Some idea of the concrete meaning of the correlations can be gained from the following table of values actually obtained. We see that Stature and Arm Spread are correlated to the extent of +.82; here we should expect a close relation, and +.82 is pretty high correlation as things go, though it is by no means perfect. Stature and Weight are less closely correlated (r= +.59) as we might expect since a person may change his weight considerably without altering his height. Correlations higher than .85 are seldom obtained except from the use of almost identical tests. Zero values and small positive and negative values are the usual thing where the abilities are obviously quite different in kind, such as hand grip, adding, and color naming. A true, significant negative correlation between any two abilities is practically unknown. The general result is perfectly clear: abilities are positively rather than negatively interrelated, though the relationship is usually moderate rather than close. . . . From the correlation of +.70 between computation and arithmetical reasoning we see that the two abilities have much in common, yet not overmuch since this correlation is far from perfect. From the low correlation of +.25 between English and drawing we can infer that these two abilities have a little in common, but only a very little. In general, correlation indicates how far two abilities are the same and how far they are different."

TABLE V

A FEW CORRELATIONS: (from various sources). Woodworth, *Psychology*, p. 70

Anthropometric and strength tests	
Stature and Arm Spread, men	.82
Stature and Weight, men	.59
Stature and Grip, men	.43
Grip, Right Hand vs. Left Hand, men	.74
Grip and Tapping, men	.25
Grip and 100-yard Dash, women	.16
Scholastic tests	
Word Meaning and Paragraph Meaning	.80
Arithmetic: Computation and Reasoning	.70
Punctuation and Spelling	.60
Vocabulary and Spelling	.50
Reading and General Information	.40
High School grades	
Algebra and Geometry	.65
English and French	.50
English and Art	.15
College grades (West Point)	
Two English courses	.77
English and History	.68
English and Physics	.48
English and Mathematics	.49
English and Drawing	.25
Mathematics and Physics	.78
Mathematics and History	.44
Mathematics and Drawing	.48

Aside from its value in making clear what correlations of different size mean, the above Table V will help us to interpret similar correlations obtained from our results with the ten Stanford Achievement subject tests. Table VI gives a series of intercorrelations obtained from the first use of these tests in two schools.

In Table VI the correlations have been listed from highest to lowest to facilitate interpretation. It will be noted that there are six correlations above .82, and we at once recall Woodworth's statement that such high correlations are "seldom obtained except from the use of almost identical tests." In what sense may we say that these tests are identical? This may reasonably be said of tests 1 and 2 which are both reading tests that depend largely upon the ability to get the meaning of words from text. The tests of Literature, History, Geography and Physiology are all given by the same technique, i.e., the multiple choice method; but Spelling and Language Usage are tested in other ways. All these tests would be classed as verbal. The most important element in similarity, however, is the fact that all these tests involve the use of braille which not only requires a great deal more time but causes much more fatigue than occurs when these tests are given visually. When we examine the correlations involving arithmetic we find figures which remind us of the .70 correlation for Arithmetic in Woodworth's table. Although the

TABLE VI

PRODUCT MOMENT INTERCORRELATIONS BETWEEN SUBJECT TESTS OF THE STANFORD ACHIEVEMENT TESTS IN TWO SCHOOLS FOR THE BLIND

Two tests correlated	School A, 1935		School B, 1936	
	Number tested	Cor.r	Number tested	Cor.r
5. Literature and 6. History and Civics			73	.93
1. Paragraph Meaning and 2. Word Meaning	104	.88	60	.89
2. Word Meaning and 3. Spelling			74	.85
4. Language Usage and 3. Spelling	96	.85		
7. Geography and 6. History and Civics			74	.83
7. Geography and 1. & 2. Reading	100	.81	78	.80
4. Language Usage and 5. Literature			72	.80
7. Geography and 5. Literature	100	.79		
7. Geography and 8. Physiology and Hygiene	103	.79	75	.77
9. Arithmetic Reasoning and 8. Physiology and Hygiene	100	.74		
9. Arithmetic Reasoning and 10. Arithmetic Computation			75	.71
1. Paragraph Meaning and 10. Arithmetic Computation			75	.66

arithmetic also is done in braille, the mental processes involved are numerical rather than verbal; so we are not surprised to find the correlation of Paragraph Meaning and Arithmetic Computation at the bottom of our list.

In order to determine the influence of braille reading ability upon success in these tests two further series of calculations were performed. Table VII gives a series of correlations obtained from the scores of all the pupils tested in Perkins Institution from 1935-40, using only the first testing of each pupil. Here, the average of the two Reading tests, 1 and 2, was correlated with the total scores on all ten tests and with each of the other eight tests. As before the correlations are listed from highest to lowest, and as before those at the top of the list are very high correlations, while the lowest one is just under .80. The correlation of Reading to total score in this year's testing at Perkins Institution has been added.

Fortunately statisticians have given us a technique by which it is possible to find out the true correlations between our various subject tests. By the process called "partial correlation" we can determine the relationship between scores in literature and history, geography and arithmetic, with the influence of facility in braille reading eliminated or "held constant." This process is described in Garrett's *Statistics in Psychology and Education,* 1930 edition, pages 221 ff. Table VIII shows the results obtained by Garrett's "Formula 49."

In Table VIII we find an answer to the question we raised in our discussion of Table VI. There is now only one high correlation, that between Literature and History, which we can easily understand by assuming that the pupils who like to read and have the type of mind that tends to collect and remember facts might easily gain information on both subjects in many of the books that come into their hands. Geography, however, shows a very modest correlation both with Literature and with History, apparently because the details included in the Geography

TABLE VII

PRODUCT MOMENT CORRELATIONS OF READING WITH THE OTHER SUBJECT TESTS OF THE STANFORD ACHIEVEMENT TESTS AND WITH TOTAL SCORE. PERKINS INSTITUTION, 1935–40

Average of Reading tests 1 and 2 with—	Number tested	Cor.r	PE
Total score (1940)	74	.969	.0048
Total score (1935–40)	181	.968	.0031
3. Spelling	174	.957	.0043
4. Language Usage	181	.910	.0086
6. History and Civics	175	.844	.0146
8. Physiology and Hygiene	180	.836	.0154
5. Literature	175	.814	.0173
10. Arithmetic Computation	181	.807	.0171
7. Geography	179	.806	.0177
9. Arithmetic Reasoning	179	.789	.0191

test would not come from general reading, but from the special study of geography itself. The two correlations for Geography may be compared with the correlations in the forties in Table V. With reading held constant the correlation between the two Arithmetic tests is reduced from .71 to .40, which is easily understood when we examine the tests themselves. Arithmetic Reasoning consists of a series of problems, many of which can be solved mentally, i.e., without recourse to the use of arithmetic slates, as soon as the problem has been read. Arithmetic Computation, however, involves the tactual reading of examples printed in braille many of which include so many figures that they must be set up on arithmetic slates before the necessary processes can be carried on, and in some cases involves the understanding of descriptions of plane and solid figures which are drawn in the tests used by the seeing. In general the tactual material of these two tests as presented to the blind is far more unlike than is the material presented to the seeing and one might expect a much lower correlation for the blind than the .70 reported in Table V from Woodworth. As a matter of fact, a test battery is rated higher if the intercorrelations of tests are not too high; we want a series of tests that measure different abilities and we can be sure of this only when we have low correlations. So the correlations in the forties which we have just discussed, and the still lower correlations below them in Table VIII, help to justify our high opinion of the Stanford Achievement Tests. Perhaps a word should be said concerning our single minus correlation, —.20 for Spelling and Language Usage, especially since these tests have a correlation of .85 in Table VI. Obviously reading and writing in braille are far more closely related than reading with the eyes and writing with the hand as would be the case when these two tests are given to seeing pupils. In general a correlation as low as .20 is not considered very significant, whether it is plus or minus, and it would mean here that when reading is held constant there is practically no relation between Spelling and Language Usage—a conclusion with which we would probably be inclined to agree. The pairs of tests in Table V from Woodworth which have correlations of .25 and below similarly involve abilities which seem to have very little in common.

TABLE VIII

PARTIAL CORRELATIONS OBTAINED BY APPLYING GARRETT'S FORMULA 49 TO DATA FROM TABLES VI AND VII

(Reading Held Constant)

Stanford Achievement Tests—Correlations	Cor.r
5. Literature and 6. History and Civics	.809
5. Literature and 7. Geography	.42
6. History and Civics and 7. Geography	.47
9. Arithmetic Reasoning and 10. Arithmetic Computation	.40
4. Language Usage and 5. Literature	.306
8. Physiology and Hygiene and 9. Arithmetic Reasoning	.29
8. Physiology and Hygiene and 7. Geography	.28
3. Spelling and 4. Language Usage	−.20

Conclusions Upon the Value of the Stanford Achievement Tests for Blind Pupils

There seems to be no doubt that this series of tests is admirably suited for use in schools for the blind. The results obtained from first tests in nine schools yield curves which show regular increases in average score from grade four to grade nine, and in seven of the ten tests these curves correspond very closely to the seeing norms. In Literature the blind fall below and in Geography the blind rise above the seeing; in Arithmetic Computation the technique of testing puts tactual readers at a decided disadvantage, but the average scores in this test show a steady rise from grade to grade, and the curve we have printed may be used as a norm for blind pupils. The use of the five forms in successive years at Perkins Institution indicates a high reliability for the test and its validity is attested by satisfactory correlations of test results with teachers' estimates of achievement and with standard intelligence tests. Inter-test correlations, and partial correlations to hold con-

stant the great influence of facility in braille reading upon success in the other tests, show that as a battery the Stanford Achievement Tests give a very good measure of the success of blind pupils in the elementary school. It would seem to be very wise to continue the use of Forms V, W, X, Y and Z, upon which this study has been made.

Specific Suggestions for the Use and Interpretation of Forms V, W, X, Y and Z

For administering these tests a school should obtain from the American Printing House the items listed in Table IX. In the reprint of the article by Hayes, "The Measurement of Educational Achievement in Schools for the Blind," first published in the Teachers Forum, IX, 1937, pp. 82-90 and included in his *Contributions to a Psychology of Blindness,* American Foundation for the Blind, 1941, detailed instructions for the administration of the test will be found.

These profile charts have proved so valuable in the study of individuals that some elaboration of the method described on page 8 and illustrated on page 9 of the "Directions for Administering" seems well worth-while. In general the scheme is, first to check on the chart the dots representing the pupil's scores and total score, and the educational age at the same level as the total score; then check the dots for his chronological age and his school grade and draw a line connecting all the dots that have been checked. The peaks and valleys will show the pupil's success or failure in the different subjects and indicate where remedial work is most needed. Next draw straight horizontal lines at the level of his chronological age and his school grade and you can make an immediate comparison with

TABLE IX

MATERIALS NEEDED FOR STANFORD ACHIEVEMENT TESTS, FORMS V, W, X, Y, Z

Reprint of Hayes' article, "Measurement of Educational Achievement" ..... On quota
Braille test pamphlets for form chosen ..... On quota
Whole series of ten tests or any single test
(One pamphlet needed for each pupil to be tested)
Specimen set of inkprint material for form chosen ..... At cost
1 inkprint copy of test
1 key for scoring
1 directions for administering
1 class record and analysis chart
Profile charts in packages of 25 or 50 ..... 2c each or $1.40 per C
(One chart needed for each pupil to be tested)

the seeing norms. Wherever his curve rises above the line for his age or grade he is superior; wherever his curve falls below these lines he is inferior.

Profile charts should be preserved and when a second form of the test is used, a half year or a year later, new curves should be drawn, using another color of ink or crayon. In this way the teacher has a record which will indicate progress or continued failure in each subject, and has an objective method for checking up the effects of any remedial work she has attempted. Of course one would hope to see a gradual upward movement from all the low points and an approximation to the age and grade norms, with all children of average ability. The curves of superior pupils should be above the norms.

Reports of testing will be most warmly welcomed by the writer of this article, who will reciprocate by analyses and interpretations of the material received. Such reports should be presented in the following form, one grade on a sheet, with the children listed from best to poorest according to total

Pupils' names (Best first)	Boy or girl	Date of birth	CA	Hayes-Binet		Scores in Stanford Ach. Tests						Ave.
				MA	IQ	1	2	3	4	5	6—etc.	

score on the test. The form used and the date of testing should be reported.

At the left of Table X we find School A testing very well in reading. The average score is above the norm in every grade, and quite conspicuously above in grades five and seven. The per cent of norm is obtained by dividing the average score by the norm. These per cents show at a glance how well each grade is doing.

At the right of Table X we present a scheme for noting grade progress from year to year. If diagonal lines are drawn from the scores in the various columns to the scores in the next line above in the succeeding column or columns we see that in most cases scores improve from year to year, but that in two cases, which are underlined, the average scores declined. One would then look up the group that formed the seventh grade in 1938 and try to discover why they tested lower in reading in 1939. Similarly one would seek to discover why the group that started as grade four in 1938, after making good progress for two years, fell back in 1940. Of course changes in the grades would occur from year to year, but if regular progress is the rule, we must explain the exceptions. The differences in average scores noted when we study this table horizontally are the natural result of the different abilities of the pupils who make up a given grade in succeeding years.

Table XI was constructed to make it easy for the school principal, or any teacher to see just what each individual child has accomplished in comparison with the school as a whole and to give a basis for explanations of success or failure. The children were listed from best to poorest in terms of their reading tests 1 and 2. Their best and their poorest scores were printed next as a check upon their teachers' impression of their work. In this particular school 23% got their highest score in Language Usage, 17% in Geography and Arithmetic Reasoning and 16% in Paragraph Meaning; 22% got their lowest score in Language Usage, 21% in Physiology and 17% in History. It is of course always important to consider *IQ* in discussing a pupil's work, but in a table like this the *MA* is perhaps more important. At the right are three other columns of importance, *EA* or educational age which may be read off from the profile chart at the level of a pupil's total score, *EQ* or educational quotient obtained by dividing educational age by chronological age, and *AQ* or accomplishment quotient obtained by dividing educational age by mental age. The *AQ* seems particularly useful since it stimulates discussion and leads to a check on the other figures. In general an *AQ* of about 100 is what we should find for this means that a pupil is making full use of his abilities. In our table the second pupil has an *AQ* of 134. We note that he is nearly at the head of the school in reading, and that

TABLE X

SAMPLES OF METHODS USED IN STUDYING TEST RESULTS

Results by Grades in School A
Form X—October, 1940

Test 1. Paragraph Meaning

Grades	Norms for October	Number tested	Average score	Percent of norm
9	96	11	105	109
8	90	12	94	104
7	83	8	101	122
6	75	11	88	117
5	64	18	85	132
4	51	14	56	110
			Average	116

Progress in School C
Average scores by grades at four dates of testing

Test 1. Paragraph Meaning

Grades	February 1938	February 1939	November 1939	November 1940
9	107	99	95	106
8	96	80	98	102
7	88	92	95	88
6	86	92	92	93
5	77	76	82	75
4	63	70	65	65

he obtained the highest score in geography but his *IQ* is only 101. It would seem that he should be given a new intelligence test at once. If his *IQ* and *MA* are really much higher, his *AQ* would approximate 100 as it should. A little lower in the column we find an *AQ* of 85. We note that this pupil has a high *IQ* and a high *MA*. As he is high in reading he has probably had a fair number of years in a school for the blind, but for some reason he is not doing school work up to the level of his ability. The cause should be sought.

Directions for Giving the 1940 Stanford Achievement Tests, Forms D, E, F, G, H

The general structure of the 1940 forms is so similar to the V, W, X, Y, Z series that the directions in the writer's reprint can be used by recording minor changes in the margin. The material for form D, intermediate (for grades 4-6) and advanced (for grades 7-9) is now being put into braille at the American Printing House and the material for form E will be made available as soon as a considerable number of schools have ordered form D. As in the earlier forms, the tests on Paragraph Meaning and Arithmetic Computation have been divided into two parts, A and B, since the two and one half time-allowance necessary for blind readers would make these tests too fatiguing. In the new forms the test in Arithmetic Reasoning has been similarly divided. In the division of these tests into parts, alternate test items have been used in most cases, and the total scores of each pair of parts equalized. Since the items in the inkprint tests are arranged in order of difficulty, this method should give parts of approximately equal value, and either part may be used alone. But where time permits both parts should be used. Table XII gives the time schedule. In general it seems best to give one test at a school session, spending the balance of each period in regular school work, since two tests with working time of 25 minutes each added to the time

TABLE XI

INDIVIDUAL DIFFERENCES IN RESULTS OF STANFORD ACHIEVEMENT TESTS IN SCHOOL C, NOVEMBER, 1940

Names in order of reading score	Average of tests 1 and 2	Best score in ten	Poorest score omitting reading	IQ at last Hayes-Binet	Status at time of Stanford Achievement Tests, Nov. 1940 CA	MA	Average score in S.A.T.	EA	EQ	AQ
A. The ten best readers in the school										
E. G.	116.5	Geog. 128	Dict. 100	113	14:11	16:10	113.8	17:7	118	105
H. A.	111	Geog. 134	Dict. 86	101	12:9	12:10	111.4	17:2	135	134
C. W. S.	110	Hist. 118	Phys. 83	115	14:2	16:4	109.1	16:10	119	103
M. S.	109.5	Par. 119	Prob. 96	126	15:4	19:4	107.5	16:6	108	85
C. L.	109	Geog. 120	Phys. 98	121	14:8	17:9	111	17:2	117	97
E. O.	107	Lang. 118	Phys. 99	113	15:10	17:11	108.1	16:8	105	93
A. C. B.	105.5	Lang. 119	Geog. 95	109	15:9	17:2	104.4	16:2	103	94
A. P.	105.5	Par. 109	Geog. 69	86	15:10	13:7	90.4	13:11	88	103
C. V. H.	105	Prob. 104	Geog. 86	109	15:2	16:6	100.1	15:8	103	95
W. M.	104.5	Geog. 112	Phys. 85	112	16:4	17:11	103	16:	98	89
B. The ten poorest readers in the school										
S. C.	65.5	Phys. 71	Lang. 46	82	12:9	10:5	60.6	10:9	104	83
E. S.	62	Lit. 64	Hist. 20	91	12:6	11:4	52.7	10:2	81	90
W. E.	61	Geog. 70	Phys. 57	91	16:2	14:6	64.6	11:1	69	77
A. R. M.	60	Hist. 81	Lang. 38	80	16:9	12:9	64.1	11:	71	87
J. G.	59	Lit. 79	Lang. 42	85	11:10	10:1	57.1	10:6	89	104
T. S.	57.5	Lit. 69	Lang. 20	93	12:4	11:5	50.3	9:11	81	87
A. F.	56	Lit. 85	Hist. 20	105	10:5	11:	58.7	10:7	102	96
J. E. B.	55.5	Lit. 69	Lang. 20	83	10:7	8:9	51.1	10:	99	104
E. R.	51.5	Dict. 58	Lang. 20	92	12:4	11:4	46.1	9:8	78	85
S. S.	39	Phys. 55	Lang. 20	101	11:7	11:8	38.3	9:1	78	78

needed for passing out materials and giving preliminary instructions cause undue fatigue, and may have an adverse influence upon the second test given. Unfortunately this extends the testing through several days, but since these tests may be substituted for other examinations in the subjects involved, the use of the Stanford Achievement Tests and the discussion of the items after the pamphlets and papers have been corrected and returned, make an excellent and stimulating inventory of school progress.

Directions for Giving the Stanford Achievement Tests, Forms D, E, F, G, H

Test 1. A and B Reading: Paragraph Meaning

Use the directions as given in the Hayes article, with these minor changes which may well be written in the margin: In form D there are *two* blanks instead of *one* in the sample sentence, and from two to four blanks in the test paragraphs. So the first sentence in the directions should be changed to read, "The first test consists of a number of paragraphs, in each of which there are two or more missing words." And in reading the sample sentence, the word "ball" should be omitted.

Notice that the time allowances for form D are 30 and 25 minutes, instead of 35 and 35 allowed in the earlier form which was longer.

Test 2. Reading: Word Meaning

Notice that in form D there is a third sample, which should be added to those given in the reprint—"Bread is something to catch drink throw wear eat."

Test 3. Language Usage

This test may be given with the instructions for test 4, Language Usage, in the reprint, merely changing the time limit from 25 minutes (seeing allowed 10 minutes in older form) to 38 minutes (seeing allowed 15 minutes).

Test 4. Arithmetic Reasoning

This test may be given with the instructions for test 9 in the reprint, merely changing the

TABLE XII

SCHEDULE OF TIME ALLOWANCE FOR THE TESTS OF FORMS D, E, F, G, H INTERMEDIATE OR ADVANCED

Test	Minutes Seeing	Minutes Blind
1. Paragraph Meaning	20	(A) 30; (B) 25
2. Word Meaning	10	25
3. Language Usage	15	38
4. Arithmetic Reasoning	20	(A) 30; (B) 25
5. Arithmetic Computation	30	(A) 40; (B) 35
6. Literature	10	25
7. Social Studies I	10	25
8. Social Studies II	10	25
9. Elementary Science	10	25
10. Spelling	No time allowance	

TABLE XIII

MATERIALS NEEDED FOR STANFORD ACHIEVEMENT TESTS, FORMS D, E, F, G, H

Reprint of Hayes' article, "Measurement of Educational Achievement" ..... On quota
Braille test pamphlets for form chosen, intermediate or advanced ..... On quota
  Entire series of tests or any single test
  (One pamphlet needed for each pupil to be tested)
Specimen set of inkprint material, intermediate (grades 4-6), advanced (grades 7-9) ..... At cost
  1 inkprint copy of test
  1 key for scoring with monographs for tests 2, 3, 6, 7, 8, 9
  1 spelling list
  1 directions for administering
  1 class record and class analysis chart
Profile charts in packages of 25 or 50 ..... At cost
  (One chart needed for each pupil to be tested)

time limits from 50 minutes for the whole test, to 30 minutes for part A and 25 minutes for part B.

Test 5. Arithmetic Computation

The advanced form of this test may be given with the instructions for test 10, Arithmetic Computation, in the reprint. When the intermediate form is used the following paragraph of explanation should be substituted for the words "Does everyone understand?"

"We will do the first two examples together to make sure that everyone understands. Look at example 1. It tells you to add 3 and 2. After adding, you should write the number of the example and the answer, which is 5, on your braille slates. Look at example 2. It tells you to subtract 1 from 4. Write the number of this example and your answer, which is 3, on your braille slates. We are now ready to begin the test with example 3."

Test 6. Literature

This test may be given with the instructions for test 5, Literature, in the reprint, substituting for the examples used in the old form, the ones given in the new: "Turn to test 6 and notice the sample sentence at the top of the page. It reads: 'The Bible is the name of a place book country.' *Book* is the word that makes the sentence true, so draw a line through the word *book*. Look at the second sentence. It reads: 'Jack Spratt could eat no meat bread fat.' *Fat* is the word that makes the sentence true, so draw a line through the word *fat*."

Test 7. Social Studies I

This test may be given with the instructions for test 6, History and Civics, in the reprint, by substituting "social studies" for "history and civics" in the first sentence, and inserting after the sentence "This is another test like the one on literature," the following: "We will try the two sample sentences at the top of the page. 'The number of stripes in our flag is six seven thirteen.' *Thirteen* makes the sentence true, so draw a line through the word *thirteen*.' Now look at the second sample sentence. 'Which of the following was an Indian? Hiawatha Buffalo Bill John Smith.' *Hiawatha* is the correct answer, so draw a line through *Hiawatha*."

Test 8. Social Studies II

The same instructions may be used for this test as for Social Studies I, substituting the appropriate sample sentences. Say: "We will try the two sample sentences at the top of the page. 'A day of the week is January Friday summer.' *Friday* makes the sentence true, so draw a line through the word *Friday*. Now look at the second sample sentence. 'Which of the following is a city? Europe Texas Detroit.' *Detroit* makes this sentence true, so draw a line through *Detroit*."

Test 9. Elementary Science

The same directions may be used for this test as for the tests in Social Studies, substituting "elementary science" in the first sentence and the new sample sentences. Say: "We will try the two sample sentences at the top of the page. 'Horses have feathers hair scales.' *Hair* makes the sentence true, so draw a line through the word *hair*. Look at the second sample sentence. 'Which of the following is very heavy? cotton cake iron.' *Iron* makes the sentence true, so draw a line through *iron*."

Test 10. Spelling

For this test use the following directions, slightly modified from those printed in the inkprint pamphlet "Directions for Administering." Say: "Now I want you to write some words. I shall pronounce a word, read you a sentence with that word in it and pronounce that word again. Then you will write that word. You may put two words on a line. The first word is ...."

The examiner should pronounce the first word to be spelled. Pause slightly; then read the sentence, stressing the word to be spelled.

(*Continued on page* 18)

The Recreation Program at the Washington School for the Blind

Charles Buell

The impulse to play is universal. Blind children desire to express their play impulses just as keenly as seeing children and because of their handicap special effort should be made to bring about normal growth and development in their case. A good recreation program, directed by a leader who thoroughly understands the subject, will do as much to develop normal personalities as any other school activity. In schools for the visually handicapped this recreation program should not only offer as many play activities as in the public schools, but should be made to serve as a major socializing factor between the blind and the seeing.

The Washington School for the Blind has developed this type of program, with varied recreational activities, including athletics, indoor and outdoor games, dancing, reading and story telling, pageants, music, drama, and social functions. Through participation in some or all of these, the boys and girls of the school are enabled to cope with problems of self-adjustment, so that by the time they complete school, a sense of confidence has replaced, in the majority of cases, the feeling of inferiority common to many blind persons.

Since the author has previously discussed athletics for the blind,[1] only a few words will be devoted to physical activities. In groups composed of visually handicapped players, the blind enjoy all the major sports, and they can compete on an equal basis with seeing opponents in wrestling, swimming, track and fieldwork. Two of the best high school wrestlers in the northwest are students at the Washington School for the Blind. The California School for the Blind develops teams in football, basketball, track and field-work to compete in the Berkeley playground leagues.

Baseball, skating and croquet are the most popular outdoor activities at the Washington School. Under the supervision of the recreation leader, the girls and boys skate together and play baseball and croquet. These mixed group activities have aided in the development of normal relationships between the sexes.

Dancing, conducted under wholesome conditions, has great educational and social values. The girls and boys are encouraged to attend the informal dances held in the school gymnasium. Here they have an opportunity to dance with young people from the community who are invited to social functions at the school, and are thus prepared to take part in community social events when they return to their homes.

Indoor games play an important part in the recreation program of the Washington School. Each year tournaments are conducted in checkers, chess, dominoes, and table tennis. Since children soon grow tired of such activities, other games, suitable for use by the blind and those with partial vision are introduced in order to maintain interest. Some games of this type, with the addresses of their manufacturers, are listed below.[2]

Pin ball games, with the money attachments removed, have afforded the students much enjoyment. A major league baseball game is in almost constant use. With the glass removed from the top of the frame, the blind boys are able to determine the po-

[1] Physical Education in the California School for the Blind, *The Teachers Forum*, May, 1936..

[2] *Touchdown,* Cadaco, Ltd., San Leandro, Calif.; *Basket,* Cadaco, Ltd., San Leandro, Calif.; *Klik Ball,* Montgomery Ward & Co.; *Gee-Wiz Horse Racing Game,* Wolverine Supply & Mfg. Co., Pittsburgh, Pa.

(*Continued on page* 18)

DR. ALLEN SAYS:

"Guiding A Child in Early Years Means All in His Development"

(Dr. Irving H. Cutter)

The Boston Nursery for Blind Babies has been one of several allied agencies always visited by my Harvard classes. I tell these students that this project is the only private one in our field known to me which being adequately endowed, doesn't beg.* It has memorial cribs and rooms, one of the latter equipped for surgery, but the house and atmosphere are not institutional; its site is beautifully suburban, and it is near a park and a brook.

Long a residential nursery for twenty-five visually handicapped babies, some temporarily there to be built up after eye operations, it is now also a "creative venture" in preschool training under a professionally prepared staff; that is, it aims to thoroughly fit capable pupils for a kindergarten at the usual age of five years.

It is of this feature that I write.

If the current theory that all children benefit from preschool training is correct, surely those need it most whose visual handicap shuts out the major appeal to self-activity which eyesight gives. Great Britain applies this theory, as does the New York Lighthouse in its day nursery school, and as the Arthur Sunshine Home at Summit, N. J., had begun to do in training both teachers and pupils, until, alas, it closed temporarily for lack of funds. But the Boston approach has been its own.

Here the new education, while building up the body to health and vigor, seeks by the child's second year to develop mind and character through the selecting and fostering of his interests. Therefore it progressively introduces meaningful situations and, though stressing "serenity, individuality, and non-interference," considers self-control and unselfish behavior goals to be attained at an early age.

We notice that much time is given to creative handwork and free play, the games and other socializing activities of the partially seeing children greatly stimulating the blind ones to play, too. Undesirable activities are prevented by suggesting or bringing into play constructive ones. Still we are told that appropriate punishment follows misconduct. Fundamental principles for the teacher seem to be, however: keep hands off; do little obvious teaching; motivate the children to do their own learning.

All this is apparent whether the children are on the playground, roller skating, tricycling, sliding, climbing the junglegym, or gardening nearby; whether, too, on the sunporch or in some room where small groups frequently gather about little low tables, to exercise and develop the senses of touch, hearing, smelling and tasting as well as their manual skills, through the use of modeling clay, scissors, blocks, pegs, beads, insets, and weaving; or serving and eating luncheon with the teachers, or assembling in the music room to listen to the Victrola, or joining in singing and marching games, perhaps only for the pure enjoyment of the rhythm of it all; or lying down for a period of relaxation and rest.

Everything has its meaning, its purpose. Since pleasure follows accomplishment, so these tots are led on to do for themselves one after another of the things of daily life, even such as dressing without help. Self-helpfulness and a justified feeling of independence are made basic virtues, particularly needful in the general process of character and personality building.

Some of us see in preschool training our hope for the future. Certainly student visitors

* This is now no longer the case.

come away from this laboratory satisfied that it is as invaluable as novel. The Boston nursery and school, realizing that there is no equivalent for normal family life, does everything it can to keep up home ties, a few children attending as day pupils, and a few going home week-ends. But it admits and welcomes children, if educable, from anywhere. Their friends are expected to pay what they can, no matter how little. It is better so.

(*Continued from page* 15)

Pause slightly; then pronounce the word again. Allow enough time for all pupils to write the word; then continue with the remainder of the words in the following manner: "No. 2 . . . ." and continue with the sentence and second pronunciation of the word. After each two words tell the pupils to use a new line on their slates.

The words to be used for the different grades will be found on the spelling lists furnished in the specimen set. The examiner should give all words clearly, in a natural voice, being careful not to confuse the pupils by unfamiliar pronunciations. If several teachers are to cooperate in giving this test, they should go over the words together and decide upon the pronunciations to be used, giving alternative pronunciations when the chilren do not seem to recognize a word. When the more difficult sentences are reached, it is well to encourage the pupils with such expressions as, "Do the very best you can, even if you are not able to write all the words."

(*Continued from page* 16)

sitions of the base runners. Tournaments and pennant races are organized.

Touchdown, a dice football game, is the leading pastime of the fall months. A play is called before the dice are thrown. In a short time the boys commit to memory the chart of gains and losses which accompanies the game. The boys represent college football teams and hold conference games.

The prediction of college football scores has become very popular. Each Monday during the football season, twenty games are selected from the hundreds to be played the following Saturday. The boys hand their written predictions to the recreation leader and later the winner of each week's contest receives a candy bar. This rivalry has not only developed some experts, but has stimulated interest in radio football broadcasts.

During the winter months, a game called *Bas-ket* is enjoyed. This is played on a board having the form of a small basketball court. A ping-pong ball rolls around on an uneven surface until it settles into one of twelve holes. The player then operates a lever which propels the ball toward the basket. As in other games the boys choose college teams and plan conference races.

Klik Ball, a new game of skill, is another popular pastime. In this game, a cue is used to push balls up an incline marked with numbers. Since a mechanical device prevents the balls from rolling to the foot of the incline, a blind player can read his score. The boys of the Washington School have worked out a system by means of which they can conduct an entire track and field meet on a Klik Ball court.

Many other games are played in leisure hours. During the year, interest shifts from game to game, and one cannot predict which will come into popularity next. If plenty of suitable games are available, both girls and boys will use their leisure time for play.

Money invested in games pays high dividends, for there are few discipline problems among students who occupy their leisure time in playing games. Far more important, however, is the fact that these handicapped girls and boys are learning to do things that are enjoyed by the public school child. When these students leave the school for the blind, they are able to join in social activities anywhere. This insures for them a happier and more enriched life.

An Experiment In Teaching

Grace M. Rupert

Last year I was asked to teach a course in chemistry and dietetics to a class of eight junior high school girls in the Ming Sum School for the Blind in Canton, China. These girls have about the same educational background as seeing students in the same grades in the United States but are slightly older than the average junior high school student.

I had had neither training nor experience in teaching those who cannot see but I was willing to attempt to adapt my own teaching methods for use in this class. As in most of the teaching in Canton, this course was to be given in the Cantonese language and there is not any book for reference in either chemistry or dietetics in Cantonese braille. This meant that the entire course should be given by dictation.

The course in general chemistry did not include any laboratory work, but many simple experiments were explained and the properties of the more common elements, their compounds and their reactions were studied. The students were taught symbols, formulas, the writing of equations for simple reactions, and calculations of practical problems based on reactions. Since this course served as a foundation for dietetics, it covered some biochemistry, namely, the origin, building up and breaking down of the food elements and their digestion, absorption and use in the human body.

The students' response to the course was phenomenal. I have been teaching college, medical and nursing students, both in the United States and China, for the past twenty-two years, and never have I had such a satisfactory response from students as from those at Ming Sum, whose work was far beyond my expectations. Symbols were learned readily and in no time balanced equations could be given orally without first being written. Calculations were done mentally with remarkable speed, faster than I could do them on paper. The course was given in Cantonese but at the same time, English names and terms were taught in order to increase the students' English vocabulary.

The course in dietetics presented a special problem since the fare at the Ming Sum School is exceedingly simple and limited. Instead of stressing the fact that the more varied the food, the better our health, it was necessary to show why and how their own restricted diet was adequate from a nutritional point of view. We carefully discussed and analyzed each food in their own diet, as well as other local foods, so that the students could understand what substitutions could be made with safety. In the course was included the feeding of infants and children with special emphasis on soybean milk and soybean curd as possible substitutions for fresh milk when milk is not available, as is the case in many country districts in China. While the chief aim of the course was to present normal nutrition, pathological conditions and their relation to diet were discussed, and diets for the more prevalent diseases were prepared and studied.

Measuring utensils were handled and studied, and the girls had practice in measuring liquids and solids in spoons and cups, and in combining foods for cooking. As a final lesson each girl made a cup of cocoa, doing everything herself except the actual cooking.

This semester I am attempting a course which I call "Applied Household Chemistry," patterned somewhat after such courses given in the United States but adapted to the needs of the people of China. In this course, among other things, we take up various fuels, their origin, their chemical formation, their comparative practicability, cost and heat value,

with a detailed study of many of their by-products which include paper, soap, cellulose, chloroform and coal tar products.

I plan to include a study of the chemistry of textiles and dyes, and have samples of available fabrics which the students may learn to distinguish by feeling; of condiments, spices and flavorings which may be distinguished by smell; of quinine and other alkaloids which are used in tropical medicine.

So far the girls have entered into this study with the same enthusiasm which they showed in the course given last year and I believe they will gain much practical knowledge from this class.

The Teachers Forum

for

Instructors of Blind Children

Address all communications to

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The Editor will not be responsible for opinions expressed in signed articles

SEPTEMBER, 1941

A. A. W. B. CONVENTION

The American Association of Workers for the Blind held its nineteenth biennial convention in Indianapolis, Indiana from July 7 to 11, 1941. The program of the convention reflects the wide range of interests and responsibilities of its members. The General Sessions covered such topics as public assistance to the blind, legislation for the blind, production and sale of blind-made products, problems in library service, the Talking Book in the education of the blind, prevention of blindness, and rehabilitation. The Sectional Meetings of the Educational Division were devoted particularly to problems of special preparation of teachers, status and salaries of teachers, problems of partially-seeing children in schools for the blind and in sight-saving classes, problems connected with braille and Talking Book publishing and circulating, mental measurements of the blind, etc.

The Shotwell Memorial Award for meritorious service was presented this year to Mr. M. C. Migel, President of the American Foundation for the Blind, for his distinguished contributions to work for the blind.

The convention has certainly fulfilled its aims if exchange of constructive ideas, forming of policies, and deepening of personal bonds are the main purposes of conventions. There is no substitute for the personal contacts, but the printed report of the convention will prove an excellent source of information on the present problems of work for the blind for those who could not attend.—B. L.

A few years ago the American Foundation for the Blind approached the Western Union Telegraph Company with a request that a special rate be made to blind people who wish to employ its messenger boys as guides. At that time the rate of 40c an hour was made. The Western Union has just advised the Foundation that due to increased labor costs it is necessary to increase the rate for messenger guide service for the blind from 40c to 50c an hour, effective September 1, 1941.

While we dislike to postpone so many good articles until a later issue it seemed best to print all of Dr. Hayes' article in one issue and this seemed to be the opportune time to make it available. The present interest in testing and the use which is being made of the tests which are adapted for the blind is very gratifying. Only two of our contributors need special mention. Charles Buell has directed boys' physical education in both the California and Washington schools for the blind. Grace Rupert is at the Hackett Medical Center in Canton, China and teaches at the Ming Sum School for the Blind one afternoon each week.

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Sensory Illusions

Samuel P. Hayes, Ph.D.

Suppose you were asked how you *know* anything about the world in which you live. You would probably say that you have learned through the use of your five senses. Ever since you were a tiny baby, you have seen, heard, touched, tasted and smelled things. You soon learned that when you saw something near you, you could reach out and find it with your hands; that noises meant that people or objects were moving about and doing things. When you began to crawl about the floor investigating you constantly learned more and more about the nature of objects—their weight and size and hardness, whether they were fixed in place or easily moved—and the bumps you suffered from running into hard things and pulling objects over upon your head all helped to teach you about the world of reality. What then can I mean by hinting that perhaps you may not *know* what the world is *really* like?

Many, many years ago thoughtful men discovered that they could not always depend upon the testimony of their eyes and ears and fingers. People gave different accounts of what they saw and heard in ancient times, just as witnesses now disagree in a trial at court. Primitive magicians found that they could make people think that they saw one thing when they were really seeing another, and the success of a modern sleight-of-hand performance depends upon the skill with which the senses of the spectators are deceived. I shall give you many everyday cases in which things "are not what they seem," and before I am through you will realize that it is not so foolish after all to ask you how you know *anything* about the world in which you live. You may even feel sympathy with those philosophers who teach that all we can ever know is the sensations within ourselves, since we can never decide whether there is anything outside of us corresponding to the sights and sounds we ourselves experience.

In some people the senses utterly fail to tell the truth about the world around them. You know perhaps that some people are blind to colors. A flower that looks bright red or orange to you may seem a dull yellow to them. Color-blind people cannot see bright red strawberries in a garden; the berries and leaves look equally yellowish. There are other people whose ears cannot be trusted. They hear ordinary conversation and most of the everyday sounds, but they cannot tell musical notes apart. These people are called tone-deaf or tune-deaf, since they cannot tell one tune from another and are unable to sing tunes in key. Some of these tone-deaf people will drone along on a single tone when singing the hymns in church and so are called monotones. In old age a peculiar kind of deafness arises through decrease in the ability to hear high tones. Vowel sounds may be heard but not consonants, so, many words are misunderstood. The elderly person's "What say?" often calls for troublesome repetition. Occasionally the sense of smell fails us; temporarily when we have a bad cold, permanently in certain diseases. The loss of the sense of touch is still rarer, but cases have been recorded in which people are insensible to all the objects they touch.

All of us make occasional mistakes in judging of the things that affect our eyes and ears. We think we have seen a certain thing when we have really seen something quite different. Seeing requires more than the use of the eyes. We say that we see a chair when it is partly hidden by a table and all we actually see is the top of it. We constantly see what we are expecting to see or what we are in the habit of seeing, and we often make wrong guesses. These mistakes are called *sensory illusions*. They are very common in everyday life and occur in all of the different sense realms.

Visual illusions are the most numerous and varied, and have been extensively studied by

scientists. Many of them can best be demonstrated by the use of pictures, but a considerable number can be described. Color illusions may be illustrated by what are technically called negative after-images. Have you ever noticed that if you let your eyes linger for a moment or so upon a bright spot of color and then turn your eyes to a plain wall you seem to see a spot of color of about the same size as the one you were looking at, but of a different hue? Try gazing fixedly at a bright-colored hat and then look at a wall. If the hat was red you may see on the wall a greenish-blue spot; if the hat was yellow, you may see a blue spot. If the wall is farther away than the hat, the after-image will be larger; while if you turn from the hat to a book in your lap, the after-image will be much smaller. If you do not get the after-image at once, wink your eyes, as that helps bring it up. Still more striking after-images may be obtained from the sun. If you have ever tried to catch a baseball with the sun shining directly into your eyes, you know how you are tormented with a persistent glowing image of the sun which constantly gets into your way when you are trying to see the next ball that comes. If you will let your eyes linger a moment on the setting sun just as it begins to turn from yellow to red, you will see a most beautiful series of colors, one dissolving into another. Often a vivid center of color is framed in a contrasting color, and both of these change into others. In all these after-images the color is in you and not in the world outside. The colored hat or the sun starts the series; the rest is produced by the eye and may thus be classed as an illusion.

Still another type of color illusion is illustrated by color contrast. You have all seen colored shadows on the snow and on the water. Have you noticed green lights in the shadows of a rosy-faced girl or boy? We can get these contrast colors by a simple experiment. Lay a strip of gray across a sheet of colored paper and cover the whole with a thin sheet of tissue. You will find the gray has taken on a hue opposite to the color itself; a blue ground giving a yellow contrast, and a red ground giving bluish-green. Some people can get the contrast without the tissue paper.

We have a large number of visual space illusions. The perspective used by artists illustrates this type. They do not draw objects as they are, but as they seem to be. Stand in the middle of a street car track and look up the line. The two rails appear to approach each other in the distance and so artists draw them that way; but we know that they do *not* approach, for it would not be possible for the trolleycars to move along the rails unless they were constantly the same distance apart. Did you ever try to make a drawing of a table top? Although you may have measured the table and found it two feet on each edge, wherever you stand the lines appear to be slanting and the angles at the corners are not equal. When we see people walking away from us they appear to become smaller and smaller and if we close one eye and hold up a finger in front of the other eye we can make a full-sized person disappear behind one finger at a little distance. Now we know that a person does not become smaller as he walks down the street and we are sure no one can be as small as a finger.

Did you know that there is a spot near the center of each eye which is blind? This is the place where the nerves enter the eyeball and it is commonly called the *blind spot*. If you close one eye, look straight forward, and move your thumb about in front of your chest below your other eye you may find a spot where the thumb completely disappears. Make a large ink blot on a sheet of paper, close one eye and move the paper around as you did the thumb. At about one foot from the eye the ink blot will disappear.

There are also interesting illusions of movement. You have perhaps noticed how the moon seems to hurry along when clouds are driven rapidly by the wind. If you are sitting in a train in a station with trains on both sides of you and one of them begins to move slowly, you may well be puzzled to decide whether it is your train or the other that is

moving. Then later when your train is moving along rapidly you can see the telephone wires rise and fall in a regular rhythm as the train rushes past the poles; and if you look out over a field to some distant woods you may note a triple illusion—the telephone poles moving back past you, the fields in the middle distance moving in the same direction as the train, and the distant trees moving back and then swinging toward you and forward.

We must conclude then, that, although we are ordinarily inclined to trust them, in many situations the eyes deceive us. Most of us feel surer of the truth of things we can handle and we all understand why Thomas doubted until he had touched. Yet in the realm of touch also we often make wrong guesses. A curious illusion of this sense was discovered and recorded some thousands of years ago by a Greek philosopher and named, after him, Aristotle's Illusion. Try this experiment. Cross your second finger over your first and rub the end of your nose in between the ends of your two fingers. You can easily imagine that you feel two noses though you know there is only one there. You are somewhat more likely to get the illusion if you have someone else rub a pencil or a smooth stick between your fingers. Another touch illusion is produced by what is called *projection*—our habit of locating objects out in space where they seem to be. If you hold a cane in your hand and poke into corners and around the rungs of a chair, it seems as though the end of the cane rather than the hand was sensitive. The same illusion is evident when you write with a lead pencil or even when you feel things with your fingernails when they have grown long. This fact of projection is very strikingly illustrated in cases of amputation. When a person has an arm or a leg removed he does not always lose the sensations when he loses the limb. Sometimes for months or even years people report cramps in the heel or toes, and numbness, burning or twitching in a leg that is no longer there. The impression is often so vivid that patients start to reach down to rub the missing foot, and there is one case on record of a man with an artificial leg who said that he felt as if he had three legs in all. He sometimes found the missing member very much in the way, especially when going downstairs. One person reported that he had felt so much pain in his lost limb that he feared it had been maltreated or improperly buried so he had it dug up and its position changed eight times. In all these cases the same illusion of projection is evident. The sensations are felt where they used to be located. Some patients report the surprising experience of feeling the extremity coming nearer and nearer the body as though a leg was constantly getting shorter and approaching the hip.

You have all heard the old conundrum, "Which is heavier, a pound of lead or a pound of feathers?" and very likely you were caught the first time you heard it. If I were to give you two wooden blocks of the *same weight,* one of which was four or five times as large as the other, you would undoubtedly judge the smaller one to be the heavier. We are so accustomed to thinking of large things as heavy that we prepare to use more strength with the larger block and since it rises much easier than we expect, it seems lighter. There is an interesting touch illusion which you can perform upon your face or arm. Spread the thumb and first finger of your right hand one and a half inches apart, place the thumb and finger on the cheek near the left ear and draw them slowly across the mouth to the right ear. You will feel quite sure that the thumb and finger come together as they cross the mouth and then widen out again as they approach the right ear. To be sure that you do not change the distance you may wish to cut a space in the edge of a piece of cardboard, leaving two points to represent your fingers. Draw the cardboard across your face and note the illusion; then try the same experiment on your arm, moving the cardboard slowly from the elbow down to the finger tips. As you come down the forearm toward the wrist, the points will appear to come together and as you go over the hand

to the ends of the fingers the points will appear to spread out again.

We get a characteristic touch illusion from the tongue when we have a cavity in a tooth. The tongue is a touch magnifier. It is so sensitive that a cavity seems many times larger to the tongue than it does to the finger; and it seems larger to the finger than it does to the eye. Another touch illusion may be demonstrated by a simple experiment. If a jet of cool air is directed to the end of our finger just as it is touching perfectly dry flour, we may think we are touching something wet. This is similar to the common illusion which occurs when we think we have wet our feet; it may be necessary to take off a shoe and feel the sock to be sure whether it is wet or only cold.

There are a number of other illusions involving temperature. Probably you have all pressed your nose against a cold windowpane and noticed that your nose still seemed cold when you moved away. Cool a penny in water, dry it, and press it for a moment on your forehead. When the penny is removed you feel a definite spot of cold about the size of the penny. This illusion has been used by magicians, who press a piece of money into the hand and distract one's attention while they slip it away. The subject thinks he is still holding the coin because the after-image persists, and when he opens his hand at the signal he is surprised to find that it is no longer there. Did you ever put your hand or foot into a stream of water running into a bathtub and feel uncertain at first whether the water was hot or cold? Try this little experiment. Get three bowls or glasses of water; one hot, one lukewarm and one cold. Put the right hand in the hot water and the left hand in the cold water and after a couple of minutes move both hands quickly into the lukewarm water. This water now seems cold to the hand that has been in the hot water and hot to the hand that has been in the cold water, although it is really neither hot nor cold. Illusions of temperature may also be readily produced by suggestion. If someone says, "How hot this room is," we are very likely to agree, though we had been perfectly comfortable before. A story is told of a naughty boy who used the psychology of suggestion with great success upon his grandfather—working upon the old gentleman's faith in the thermometer. Upon seeing his grandfather sitting on the porch in a heavy coat, it was easy enough for the boy to hold his thumb on the thermometer and then call his grandfather's attention to it. A match held under the thermometer was still more effective, and the heavy coat was quickly discarded. Another day the boy used a piece of ice and drove poor grandfather shivering indoors to get warm again.

Our ears deceive us, too. If we are waiting for a belated member of the family while dinner is getting cold on the table we jump up again and again because we mistake some sound out-of-doors for the footstep of the person we are waiting for. It may be the thud of the newspaper thrown on the porch, a door blown by the wind, or any one of a dozen other noises, perhaps quite unlike the sound of footsteps. If we are walking on a lonely road with a large sum of money in our pockets we may mistake every cracking twig for the sound of a robber pursuing us. Is there anyone who has not been *sure* that a burglar was coming up the stairs when the boards creaked as the result of changes in temperature? How often we have thought somebody called our name when perhaps the actual sound was very different. We are so interested in our name and so anxious to know what anyone may have said about us that we are constantly led into wrong guesses.

Quite a different type of illusion comes from the ears, but not from that part of the ear used for hearing. If someone turns you round and round slowly on a piano stool with your eyes closed you may soon lose the sense of turning. If you are stopped suddenly, however, you think you are being turned in the opposite direction. There is a game that gives a very striking illusion of rotation. The sub-

(Continued on page 32)

Talking Books for the Grades

BERTHOLD LOWENFELD, PH.D.

THIS year, for the first time, the grade teacher in schools and classes for the blind has at her disposal a library of Talking Books particularly selected and prepared for her group of children. It is the aim of this article to answer briefly the three questions most likely to be asked by teachers who plan to use this new reading medium with their children. First, "What types of Talking Books are available?" Second, "How can Talking Books be used?" Third, "What are the advantages of using them?"

What Types of Talking Books Are Available?

The list of available juvenile Talking Books can be divided into two groups according to the mode of presentation: books in straight reading, and books employing sound effects and dramatizations in the course of the narration.

The titles listed below have been recorded with the use of sound effects, a cast of actors, and transcriptions supplied by the National Broadcasting Company. Each set of these records has on its last page a table of contents and a spelling list of unfamiliar words and names. Individual chapters are separated by silent bands thereby enabling the teacher to find the beginning of each chapter without the otherwise unavoidable hit-and-miss procedure.

Four study units in the Social Sciences:

Across the Isthmus—The Story of the Panama Canal, by E. Elsbree. 4r.
Haste Post Haste—The Story of the Post Office, by E. W. Nolen. 4r.
Wires Round the World—The Story of the Telegraph, by V. Stout. 3r.
Lights Along the Shore—The Story of Lighthouses and Lightships, by W. Starbuck. 4r.

Three units on Animal Life:

Lions, by W. W. Robinson. 3r.
Elephants, by W. W. Robinson. 3r.
On the Farm, by M. Duncan. 2r.

These titles are graded to the comprehension level of the intermediate grades but will hold the attention of older pupils as well. The three units on animal life, particularly *On the Farm,* will also be enjoyed by younger children.

The list of titles for the grades recorded in straight reading comprises almost fifty books with a great variety of themes. The following titles have been recorded since the publication of *Learning by Listening*† which includes only Talking Books recorded up to the end of 1939.

FICTION

Adventures of a Brownie, by D. M. Mulock. Grades 3-6. 5r.
Benjie's Hat, by M. L. Hunt. Grades 3-6. 4r.
Cinders, by K. Gibson. Grades 3-5. 2r.
**The Curious Lobster,* by R. W. Hatch. Grades 3-5.
Dancing Tom, by E. Coatsworth, and *Snippy and Snappy,* by W. Gag. Grades 1-3. 1r.
Davy and the Goblin; or, What Followed Reading "Alice's Adventures in Wonderland," by C. E. Carryl. Grades 4-6. 5r.
Iron Duke, by J. R. Tunis. Grades 7-up. 9r.
Little Lucia, by M. L. Robinson. Grades 2-4. 3r.
Mr. Popper's Penguins, by R. T. and F. Atwater. Grades 4-6. 8r.
Mouseknees, by W. C. White. Grades 5-7. 4r.
Noah and Rabbit: Nursery Thrillers, by H. McKay. Grades 2-4. 2r.
Roller Skates, by R. Sawyer. Grades 6-8. 9r.
Street of Little Shops, by M. W. Bianco. Grades 2-5. 3r.
The Talking Stone, by C. Cunningham. (Early American stories told by Indians and Eskimos.) Grades 5-8. 4r.
**This Way to Christmas,* by R. Sawyer. (A book of Christmas stories.) Grades 4-6.

HISTORY, BIOGRAPHY, AND HISTORICAL FICTION

Ben and Me, a New and Astonishing Life of Benjamin Franklin, as Written by His Good Mouse Amos, by R. Lawson. Grades 5-8. 3r.

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† Lowenfeld, Berthold, *Learning by Listening, An Annotated, Classified, and Graded List of Talking Book Records for Use in Schools for the Blind.* Louisville: American Printing House for the Blind, Inc., 1939.

Christopher Columbus, the Story of a Great Adventure, by E. Potter. Grades 4-6.

Daniel Boone, by J. Daugherty. Grades 5-8. 4r.

He Went with Vasco da Gama, by L. A. Kent. Grades 6-up. 12r.

**In the Beginning; a First History for Little Children,* by E. V. Erleigh. Grades 4-6.

TRAVEL AND FOREIGN COUNTRIES

Dobry, by M. Shannon. (The story of a Bulgarian peasant boy.) Grades 5-9. 7r.

The Good Master, by K. Seredi. (People and customs of the Hungarian plains.) Grades 4-8. 8r.

Jacques at the Window, by S. Emerson. (American children experience life in France.) Grades 4-6. 5r.

Luck of the "Roll and Go," by R. and L. Carroll. (A seafaring kitten takes part in Antarctic exploration.) Grades 3-5. 5r.

Pigeon House Inn, by S. Emerson. (A story of French children in Normandy.) Grades 4-6. 5r.

The Red Caboose, by M. A. Peary. (A story of Eskimos in Greenland.) Grades 3-6. 4r.

The Singing Tree, by K. Seredi. (Life on a Hungarian farm at the time of the World War.) Grades 6-8. 9r.

Taktuk, an Arctic Boy, by H. Lomen and M. Flack. Grades 3-6. 4r.

That Mario, by L. H. Crockett. (A story of a child in the Philippines.) Grades 8-up. 6r.

SOCIAL SCIENCE

(including stories dealing with related subjects)

America Travels: the Story of a Hundred Years of Travel in America, by A. Dalgliesh. Grades 3-6. 5r.

**Behave Yourself: Etiquette for American Youth,* by B. Allen and M. P. Beiggs. Grades 6-up.

Children of the Handcrafts, by C. S. Bailey. (How seventeen real children learned their handcrafts.) Grades 4-8. 8r.

Farmer Boy, by L. I. Wilder. (Life on a northern New York farm sixty-five years ago.) Grades 4-6. 12r.

Hello, the Boat! by P. Crawford. (Westward on the Ohio River 120 years ago.) Grades 4-8. 11r.

Little Blacknose, by H. H. Swift. (The story of the DeWitt Clinton engine) Grades 3-5. 4r.

Little House on the Prairie, by L. I. Wilder. (The Ingalls family moves West in pioneer days.) Grades 4-6. 11r.

Lumbercamp, by G. Rounds. (Life of a lumberjack.) Grades 6-8. 3r.

Pony Express Goes Through, an American Saga Told by its Heroes, by H. R. Driggs. Grades 6-8. 9r.

Turi of the Magic Fingers, by H. L. Williams. (Life of a caveboy 20,000 years ago.) Grades 4-6. 6r.

Willow Whistle, by C. L. Meigs. (Story of pioneer children.) Grades 4-6. 6r.

ANIMAL STORIES

Dick and Tom: Tales of Two Ponies, by M. Van Doren. Grades 1-4. 2r.

**Each in His Way: Stories of Famous Animals,* by A. Gall and F. H. Crew. Grades 5-7.

Honk: the Moose, by P. D. Stong. Grades 3-5. 2r.

Little Black Ant, by A. Gall and F. H. Crew. (A scientifically accurate story of the insect world.) Grades 3-6. 3r.

Spunky, by B. H. and E. Hader. (A story of a Shetland pony.) Grades 3-6. 4r.

**The Way of a Lion,* by A. G. Stevens. Grades 5-8.

All juvenile Talking Books mentioned can be ordered from the American Printing House for the Blind, Louisville, Kentucky and are chargeable to quota accounts of the individual schools for the blind.

How Can Talking Books Be Used?

There are three ways in which Talking Books can be used for educational purposes. First, the teacher may arrange a certain project with the reading of a book as the core. The social science units and the units on animal life would be particularly suitable for such a procedure. *Across the Isthmus,* for instance, could be read in the classroom as the main feature of a project, "The Panama Canal." In this book, the children experience a trip to the Panama Canal and the passage of a steamer through the locks; the history of the Panama Canal is vividly narrated and memorable events are dramatized; the geographical, economic, and technical importance of the canal, and the sanitary achievements during its construction are treated and illustrated with sound effects. The other units of this series are arranged in a similar way. The books of the animal series not only tell in story form interesting details about lions, elephants, and

* (In production.)

farm animals but also present sound illustrations in connection with the narration. We hear lions in the zoo: a lioness, a lion cub, and two full-grown lions in a fight. The book on elephants has an introduction describing a boy's visit to the zoo where in a dramatized scene he is told about elephants and hears them trumpeting and making their noises. The sound-picture book, *On the Farm,* tells the story of life on the farm. We hear the rooster, the chickens, the cows, the mules, and the pigs. We hear the horses neighing, a wagon coming across the fields, a tractor plowing, the sawing and felling of a tree. Kittens, sheep, and ducks make their various sounds, and a county fair is pictured in sounds and described in words. Around such a presentation the teacher can build up a classroom project, use models, field trips, and all the other techniques of modern teaching.

The second method of Talking Book usage may be described as "supplementary reading." Whenever the teacher in her course of study comes to certain subject matter that is presented on a Talking Book, she can assign for out-of-class reading the title she wants her pupils to read. These books may of course be read in class instead, with the children listening as a group, the teacher meanwhile checking and explaining whenever advisable or necessary. The list of Talking Books for the grades printed above will enable the teacher to select titles which she can assign for "supplementary reading."

The third way of Talking Book reading is "reading for fun." There are enough fiction titles available to satisfy the interests of most of our children. The books selected for recording are top-ranking books in children's libraries and, without a doubt, will be greatly enjoyed by our group of children.

What Are the Advantages of Using Talking Books?

One advantage Talking Books have to offer has already been described: "illustration" through sound effects and dramatization. We have never been able before to "illustrate" books for blind children and this shortcoming was the more serious because our children need stimulation to a far greater extent than seeing children.

Another advantage is the superior interpretation which is rendered by the professional readers of Talking Books. This is a point to be stressed particularly for children who have difficulties in the mechanics of braille reading or in comprehension of the material read in braille. In general, the lessening of strain in reading by the use of the Talking Book should lead to a stimulation of reading interest in many of our children. Such reading of course has to be followed up by properly selected braille reading assignments.

Reading to children is an old tradition in schools for the blind and certainly many of our teachers are good readers, but their time and efforts can be freed for other important purposes while the Talking Book takes over their reading duties.

The main advantage of the Talking Book, however, is the speeding up of the reading process as compared with braille reading. Dr. Hayes, in one of his recent articles, says with regard to intelligence and grade retardation, "Slowness in tactual reading is doubtless a major cause for both types of retardation, limiting the range of general reading and setting definite limits to incidental learning. A natural result is a very limited vocabulary and retardation in most kinds of reasoning which depend upon linguistic aptitude and experience."* Preliminary results of the study of the comparative effectiveness of Talking Book and braille reading have shown that the speed of Talking Book reading is about three times as great as the braille reading speed of the average pupil in the intermediate grades. This means, in other words, that with the help of the Talking Book our children can absorb three times as much reading material as they do in braille reading. This not only increases their experience derived from reading but also

(*Continued on page* 36)

* Hayes, Samuel P., "Psychology and the Home Teacher," *Outlook for the Blind,* April, 1941, p. 58.

DR. ALLEN SAYS:

A Bit of Correspondence on Training for Our Field of Service

"Dear Sir: The A.A.W.B. convention proceedings for 1937 describes your vocational course as one 'for the preparation of teachers of the blind.' I write to learn if I, a social worker, might gain from it an understanding of your general field outside of institutions."

"Dear Madam: Yes, you both could and would. Although most of my students were at the time resident apprentice teachers of blind children and would continue on to pursue the theory and practice of special schoolroom methods, I have desired to implant a really broad knowledge of the whole subject of blindness and the blind as background; in short, have striven thus to help raise our work to the dignity of a profession. One third of the lectures are given by staff members of the Massachusetts Division of the Blind, some of these being themselves without sight. There is much daily required reading.

"The Harvard catalogue explains that this course covers: The blind of the past and of today; what the public should know about handicapped people—their recreations, pastimes, and diversions; the social and industrial status of the blind; private and public provision for them; types for finger reading; lending libraries of embossed books; the human eye, the causes of visual defects and the progress in preventing them; the deaf-blind; the blind feeble-minded; the psychology of blindness; and such other matters as there is time for.

"The following questions from past examinations further indicate the scope of the course:

"Blindness is an affliction—with consequences. What are these consequences?

"Since most blind people do handwork at a disadvantage, why do we generally resort to it for their economic relief?

"Write briefly on the statement: 'The blind need not be a class. Where they form one, it is not because of their affliction but of their treatment.'

"Vastly more attention (and money) is still devoted to the care and relief of blind persons than to preventing blindness. How account for this?

"Begging for the blind and begging by the blind: comment on these practices.

"Contrast the effects of deafness and of blindness in childhood; in adulthood.

"Comment on 'The Blind Pension.'

"Write on 'The Selective Education of Blind Youth.'

"What is meant by home teaching, and what is its scope and importance?

"How were books embossed before the day of the stereotyper?

"Why do we have permanent commissions for the blind and not for the other handicapped folks?

"In general American teachers of blind children have specially prepared themselves on the job. How do their employers justify this procedure?

"The period about 1830 ushered in two important events in educating the blind. What and where were these and what were their importance?

"Explain what chiefly made possible and practical our public school classes for blind children.

"Why do we have two surviving systems of embossed types? Who devised these? And what may the thoughtful student infer from such authorship?

"'Instructing blind youth is easy; educating them is difficult.' Clarify this statement.

"Comment on the special service to blind children of preschool training.

"Tabulate the advantages claimed for (a) residential schools for blind youth; (b) public school classes for them.

The Spelling Abilities of Blind and Seeing Pupils

B. F. Holland, Ph.D.

Problem

The object of this paper is to present a comparison of the spelling abilities of blind and seeing pupils in corresponding grades. The object of the comparison is to determine whether blind pupils are retarded, normal, or accelerated in this subject, compared with seeing pupils; and to determine, if possible, the extent to which blindness affects the ability to spell.

Procedure

The procedure employed in securing data for the study involved administering the Morrison-McCall Spelling Scale to blind and seeing pupils in grades 2 to 7 at the beginning of the school year. The scale was given to all of the pupils in all of those grades in the Texas School for the Blind and to various classes of pupils in the same grades in Pease Elementary School and University High School in Austin.

The scale was administered in strict accordance with the instructions contained in the test booklet. The only variation was in the manner in which the blind pupils recorded their responses. Unable to write in script, these pupils were asked to write the spelling words in braille. The two groups of pupils were tested at the same hour of the day on alternate days. For example, the second grade in the school for the blind was tested on Monday at 11:00 and the seeing pupils in the public schools were tested at the same hour on Tuesday. A similar schedule was followed for each of the other grades. Since one or two days elapsed between the testing of different grades in the same school, a different list of words was given to each grade. Test I, for example, was given to the second grade, Test II to the third grade, and so on. Seeing and blind pupils in corresponding grades, moreover, were asked to spell the same words. All the tests were given by the writer, and efforts were made to control all irrelevant factors which might influence the results.

Results

Types of Data. The Morrison-McCall Spelling Scale is scored by finding the number of words spelled correctly for each test. After this score is found, it may be translated, by means of tables of test norms, into a number of additional indices of spelling ability and achievement, such as the T score, Grade Status, and Spelling Brightness. These scores were found, therefore, for each of the subjects taking the test in this study. Then each group of scores was subjected to statistical treatment designed to obtain measures which could be used to throw light on the problems stated above. The specific types of measures employed in the comparisons of the two groups are indicated below.

Number of Words Spelled Correctly. The number of words spelled correctly by blind and seeing pupils in grades 2 to 7 may be observed in Table I, which shows the means, standard deviations, and coefficients of reliability of the differences between the means.

Table I

Showing Mean Number of Words Spelled Correctly by Blind and Seeing Pupils

	Blind				Seeing			
Grade	N	Mean	S D$_m$		N	Mean	S D$_m$	D/σD
2	17	16.46	3.6		32	5.82	2.6	7.8
3	13	22.88	5.6		28	12.65	5.7	5.4
4	18	29.40	2.7		59	22.08	5.8	7.8
5	20	33.75	5.2		31	33.39	4.1	0.3
6	23	39.67	6.2		27	37.35	7.7	1.2
7	19	44.30	4.6		32	40.00	3.7	3.5

Inspection of the data will reveal that the blind excelled the seeing pupils in each *grade*. The greatest differences between the groups are found in the lower grades. In the second grade, for example, the blind pupils have an average score that is nearly three times

that of the seeing pupils. Though the differences are smaller between the groups in the higher grades, they are consistently in favor of the blind. The smallest differences are those between the means of the fifth and sixth grade groups, which differences are not statistically reliable. Thus it appears that blind pupils are superior to seeing pupils in spelling, particularly in grades 2, 3, 4, and 7.

Grade Status. The grade status of blind and seeing pupils is indicated in Table I, which shows the means, and standard of the means of the grade status scores made by the pupils in each group. The grade status of each pupil is determined by finding his score in a table of norms showing the average number of words spelled correctly by pupils in each grade. For example, a Gs of 3.2, which is the mean for the blind pupils in the second grade, indicates that these pupils have spelling ability normal for the third grade after two months of instruction.

TABLE II

Showing Mean Grade Status Scores of Blind and Seeing Pupils

	Blind		Seeing	
Grade	Mean	$S D_m$	Mean	$S D_m$
2	3.20	0.3	2.05	0.14
3	4.37	0.9	2.08	0.70
4	5.10	1.5	4.70	0.95
5	6.50	1.1	6.37	1.20
6	8.11	2.0	8.57	2.30
7	10.18	1.8	8.81	1.60

The data in Table II show that the blind pupils in each grade are considerably advanced in spelling. In no case do the means fall below or even at the norms for the grade. The means for all the grades, for instance, show that the pupils were advanced from one to three grades, the greatest advancement being that of the seventh grade. Seeing pupils, on the other hand, make a poorer showing. Pupils in the second grade are at grade level; those in the third grade are retarded nearly one grade; and those in the higher grades are above their grade level. In only one case, however, do the seeing pupils exceed their grade levels as much as do the blind pupils. Thus, again, it is apparent that blind pupils at different grade levels are superior to seeing pupils in spelling in each of the corresponding grades.

Brightness in Spelling. The foregoing comparisons have indicated that blind pupils in different grades are superior in spelling to seeing pupils in the same *grades*. Let us now compare the different groups of pupils to determine the relative abilities of the two groups when their *ages* are taken into account. This is done by studying the brightness scores made in each group. The Bs of a pupil is found by inspecting a table of norms to determine the amount necessary to add to or subtract from his T score to make this score equal to the score for his age, which is his Bs. Any pupil making a Bs above 50 is brighter than normal in spelling. A pupil making a Bs of 40 is 10T or 1S D below the mean for his own age group in spelling. The brightness scores of the blind and seeing pupils are presented in Table III.

TABLE III

Showing the Mean Brightness Scores in Spelling of Blind and Seeing Pupils

	Blind		Seeing		
Grade	Mean	$S D_m$	Mean	$S D_m$	$D/\sigma D$
2	42.5	11.5	54.5	4.2	4.5
3	40.8	10.6	52.5	6.0	3.5
4	38.9	12.1	48.5	7.4	3.2
5	37.3	11.3	51.8	8.3	8.4
6	43.3	10.8	52.8	9.2	3.8
7	46.1	8.0	52.1	9.8	2.6

A study of the data in Table III will reveal that the blind are inferior to the seeing pupils in spelling brightness in each grade. It will also reveal that the blind fall considerably below the means for the different grades, and that the seeing pupils slightly exceed the norms in all the grades except the fourth. Thus when this score is used, which theoretically equalizes the ages of the two groups, the seeing pupils make a superior showing to that of the blind pupils.

Conclusions and Interpretations

Data secured from blind and seeing pupils

in corresponding grades by means of the Morrison-McCall Spelling Scale seem to justify the following conclusions:

1. In terms of the number of words spelled correctly in each test, blind pupils are superior in spelling to seeing pupils in each of the grades tested.

2. Grade Status scores reveal that blind pupils excel the norms for each grade from one to three grade levels. Seeing pupils, on the other hand, show both acceleration and retardation in spelling; but they fail in each grade to excel their grade level as greatly as do the blind pupils.

3. In terms of spelling brightness, blind pupils are inferior to seeing pupils in each of the corresponding grades. In other words, seeing pupils reveal brightness in spelling equal or superior to the norm for each grade, while blind pupils reveal brightness in spelling below the norm for each grade.

Thus *grade by grade* comparisons reveal that blind pupils can spell better than seeing pupils. When their *ages* are taken into account, however, the blind pupils make a poorer showing than do the seeing pupils.

The reasons for these differences may be apparent already. One reason is that blind pupils in particular grades are considerably older than are seeing pupils. The difference in age is an advantage to the blind pupils in that they have had more experience in spelling. Blind pupils make a poorer showing in spelling brightness because the age factor is taken into account.

Another reason for the difference between the two groups of pupils may be found in the differences manifested in their manner of apprehending words in reading. The seeing child apprehends words as wholes, being able to see the words without giving attention to the letters which compose them. Blind pupils, on the other hand, must apprehend words in terms of the separate letters which compose them. That is, a word is perceived by noting the letters in successive order as the reading fingers move along the line of braille print.

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ject is asked to bend over until his head touches a cane and then to walk slowly around the cane several times. At a signal he is told to straighten up and walk through an open doorway. His efforts are then quite ludicrous to see. He staggers, waves his arms about, plunges ahead and may crash into a doorpost if not seized in time. Subjects of such an experiment report a circular swimming sensation in the head, as though some fluid revolved partly on a horizontal and partly on a vertical axis—somewhat as though you were swinging a baseball bat with the right hand over the head and down in front. The objects in the room also move strangely and the curious movements made with the hands and feet are his attempt to adjust himself to this queer revolving universe.

In our dreams we have many marked illusions. We do not realize that when we are asleep our eyes and ears may respond to lights and sounds in the world around us; but there are many cases on record in which a person has dreamed that he was in Heaven with angels of light, with beautiful colors displayed before his eyes, only to find the morning sun shining directly into his face when he woke up. We dream of an automobile accident, hear a tremendous crash and bang and find that the window sash has fallen down. We dream that fire engines are rattling and banging down the street, clanging the bells as they go, and then vaguely recognize the first notes of the rising bell. We have a nightmare in which we feel that a dog is biting at our ribs and we cannot get away from him; we awaken to find that we have been sleeping with a pajama button pressing into our side. We dream of Arctic regions where we are walking on ice and later find a foot sticking out in the cold or touching the iron bedpost. In all these cases the eyes, ears and skin were properly stimulated, but we made wrong guesses as to the cause. These are illusions like those we have when we are awake, but the guesses are not so reliable because we are

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The Relation of the Museum to Tactual Education

Nelson Coon

In both the world of the seeing and that of the blind in the past half century, museums generally have become static repositories for odd, rare or unwanted objects. But with the rapid change in educational ideas, museums are now being regarded more in the light of libraries of objects which should be living, moving and changing aids to education. Although Michael Anagnos of Perkins Institution was a leader in providing a museum of tactual objects for the blind, comparatively little has been done by any school for the blind in this country until recently. Now, however, in nearly every such institution, interest has been awakened in this subject, fostered by help from W.P.A. Model-Making Projects.

To those working with the visually handicapped, the importance of tactual education with a great many everyday objects as subject matter is an obvious need. Such observation is needed, not only in elementary teaching, for giving concrete ideas of things, but also for the stimulation of interest in many fields of more advanced study, such as art and science. Tactual education also is of great value in teaching and stimulating powers of observation. Several years ago, in the course of renovating the museum at Perkins Institution, it was decided to try some experiments which would tend to increase the use of the fine collection of objects which had long been available. The committee found that the teachers did use the objects in the cases on occasions as a particular need developed, but there was nothing to encourage a regular and systematic use of the collections.

The first procedure in revivification was to do a certain amount of cleaning, classifying and discarding. Following that, the committee laid out a program of "Exhibits of the Month" for a year which would cover a wide field of interest. The cooperation of our local museums was enlisted for the loan or gift of new material, and the W.P.A. models were drawn upon. With the continuance of that plan for two years now (the work being done as a spare time endeavor), there has been presented to the pupils, once each month, an exhibit of tactual objects which can be studied and handled in a normal class period. Each teacher, at some suitable time takes her class to the museum and either reads or tells the class the essential facts about the objects as presented in the monthly bulletin. This bulletin, which is usually about two thousand words in length, is an important part of the endeavor, as it summarizes the important scientific or interesting facts about the objects, thus saving the teacher much effort. Considerable research is done by the committee on this material to make it not only interesting, but accurate and brief. For the older pupils, the bulletins can generally be used as they are written, but for the primary grades the teachers are obliged to put the information in more simple language.

As evidence of the variety of subject matter which we have presented to the pupils, the following is a list of subjects covered over a two-year period: common birds, winter birds, shade trees, evergreen trees, common vegetables, wheat and flour, spices, sea life, fossils, daily life of the Indians, Egyptian art, Asiatic art, gems, glass, transportation and ten common animals.

In general, the number of objects in any one of these exhibits is strictly limited, ten or twelve being the usual number which can be tactually observed in a forty-minute period. For instance, in the case of the exhibit on wheat, we had samples of grains of wheat,

a large ten-inch model of a wheat grain which could be dissected, samples of various stages in the milling of wheat, and the various kinds of bread which are made from flour. We also had graphic models showing the production of wheat in various countries, etc.

That these exhibits have been of value to the teachers in supplementing their work is shown by the fact that each exhibit was, on the average, seen by nine separate classes. The favorite exhibits were those on Egyptian art, glass, vegetables, spices, transportation and gems. A recent survey of the teachers indicates that they feel that the subject of natural science should be of primary importance in such special exhibit work and that we should ever keep in mind the importance of showing commonplace objects.

It should be emphasized that this museum committee at Perkins considers that its work is purely supplemental and inspirational and that it should not and does not take the place of the teacher's share in tactual education. Many teachers devise special ways of object teaching in their particular fields: by making use of our museum; by visits to industrial plants of all kinds; by assembling interesting collections in their own classrooms; and also through experiences such as Boy and Girl Scout activities.

In the two years that this committee has been functioning, we have decided on certain essential facts regarding the work that may be helpful to others interested in promoting such a project. These may be summarized somewhat as follows:

I Museum objects should be strictly limited in number so as to avoid too casual observation or museum fatigue.

II Objects for the blind should include common and everyday objects, in order that the children may become acquainted with the host of everyday things that are hardly ever consciously noticed by the seeing.

III All objects, especially in the field of art, should be genuine. A plaster cast of a carved marble statue fails to give the blind child the proper impression, for the feel of material is fully as important as its shape.

VI It is very important that all objects should be perfect in shape and true in texture. Often we find that an imperfection of an object is remembered better than the shape of the thing itself.

V Training should be given in the meaning of real beauty. This often involves showing or explaining things which are ugly in order that there may be points of comparison.

VI With models of large objects some attempt must be made to provide a scale, such as a model of a man to give the child a point of comparison.

VII All objects should be three-dimensional. It has long since been demonstrated that two-dimensional objects are of small value in giving a picture to a totally blind person.

VIII Models of churches, houses and other buildings should be of such construction that the child can explore the inside and outside of them and relate the exterior to rooms, stairways, windows, etc.

IX Repetition and duplication in the showing of models is quite valuable. To this end, we find it wise to have exhibits available for use in the classrooms after showing them in the museum.

X Museum work must be supplemented by careful research and advice to teachers and should, if possible, provide for a curator of the museum.

XI The museum work should be coordinated with every phase of school life. In a sense, tactual models fill the same place in education as pictures in textbooks, and therefore the need for presentation of such material is found in every kind of work. This means that the persons in charge must cooperate with and know the specific problems of every teacher.

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The Blind: Music's Special Children

GERALDINE SCHOLL

MUSIC has always played an important role in the education of the blind. Nearly all blind children have been taught to sing or to play a musical instrument as a matter of course, because it was thought that music offered the best opportunities for earning a livelihood. It was formerly a vocational subject in the curriculum, but in recent years the emphasis has shifted from its vocational to its avocational value. Superintendents of schools for the blind have realized that because of the competition in this modern age there are places for only the most talented, and that the average blind musician is unable to meet professional demands.

As late as 1910, music was considered the surest and most direct means of support for the blind, and as a source of pleasure it was given secondary importance.[1] Today music is taught for its cultural and social values. It is still the centre of the curriculum, as in 1910, but the reasons for its position of honor are far different. The commercial value of music has been pushed into the background, because the day is past when a blind musician could be guaranteed a livelihood. Competition with the seeing is too keen and the demands are too great. The professional musician must have not only musical talent, but also more than average intelligence, a pleasing personality, a strong character and sound physical health. Alec Templetons are rare and blind children should be trained in a more practical vocation.

In a survey made in 1938,[2] the various branches of the music profession were rated surprisingly low. Private teaching was considered the most promising. Piano tuning was very unpromising and was valuable only as a supplement to another profession. Public performance was impractical but radio work was somewhat more encouraging. Composition, being highly specialized, was of only supplemental value. Dance orchestras offered better opportunities but competition was very keen. This study indicates that as a profession music offers limited opportunities to the blind. It is true that some will climb the ladder to success but the majority will never make a living through music.

Why, then, should music be emphasized to such an extent in schools for the blind? The education of the handicapped should be practical and if music offers little or no opportunity for a livelihood, it should not be taught. This has been the cry of many educators who overlook the many other values which music offers to the individual.

Music is a mind-trainer. The act of learning a simple composition organizes intense concentration by the pupil on the task before him. He must memorize the part for each hand of his piano music separately and then put them together. He must proceed slowly and carefully, always reviewing what he has already learned before going on to new material. Music thus trains the memory and develops a habit of systematic thinking. Regularity of practice assists in the formation of a good habit pattern. Experience in band, orchestra or other ensemble playing provides a valuable lesson in working with others, and in the subordination of the individual to the good of the group. As mental gymnastics music earns its place in the curriculum beside arithmetic and reading in the education of the blind.

Music is a great socializing and cultural agency for the blind. It gives the individual something to do during leisure time and it brightens the hours when he is left to himself. It is a faithful and pleasant companion

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[1] *Proceedings of the American Association of Instructors of the Blind*, 1910, pp. 96-98.

[2] *Proceedings of the American Association of Instructors of the Blind*, 1938, pp. 84-88.

for the sightless adult. The importance of the socializing value of music cannot be overemphasized. The blind person who plays an instrument or who has a "bag of songs" will not wonder what to do when he visits a friend or is invited to a party. He need not be a professional musician—his friends do not demand that; he need only be able to play or sing for their entertainment. Any talent for music gives the blind person self-confidence. He can "do something" and he is not shy or ill at ease in a group. He gladly enters into the spirit of the occasion and is able to contribute to the entertainment of others.

Music is also an aid to the appreciation of other fine arts, and as such is a great cultural force in the education of the blind child. He cannot fully appreciate sculpture or painting but he can enjoy to the best of his abilities, music. It does not demand eyesight to be loved; it asks only an attentive ear. Through music, the sightless person can study design in art. Music has been called "frozen architecture." Hence, cannot the blind musician, to some extent, appreciate the beauty of a Gothic cathedral by studying its musical likeness, the sonata form? Cannot he learn of Impressionism through Debussy as well as through Manet? In his study of music history the student can trace the relation of art to historical events. The structural beauty of music, revealed through the study of harmony and counterpoint, is only another example of perfection of form.

Music opens her arms to the blind and seeing alike. She gathers the sightless, her special children, about her and offers them immense cultural and social advantages; to the talented few she offers a means of livelihood. Therefore, this favored art maintains its well-deserved place of honor in the curriculum of schools for the blind.

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less able to criticize our impressions.

Our senses tell us all we can ever know directly about the world in which we live and in most of our daily life we consider the senses trustworthy. But there are many cases in which we make wrong guesses and our mistakes are called illusions. We make these mistakes in all the sense realms, and many of them are curious and well worth careful study. Having considered them, we are forewarned and can avoid confusion by taking them into account. No normal person fails to have them; no wise person fails to use them in explaining the world in which he lives.

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wins time for that type of reading material which the teacher assigns in braille. It has been felt that textbooks constitute a realm where braille is superior to the Talking Book.

Therefore, the two main objectives of the Talking Book in the education of the blind are: to compensate for the slowness of tactual reading, and to enrich the child's experience—both informational and emotional—by offering a method of audible illustrations hitherto unknown in our field.

One final word on the question of the Talking Book and braille. There is no competition between these two reading media. The educator of blind children is just as much interested in improving the braille reading standards of his students as in helping them to overcome the main disadvantage inherent in tactual reading—its slowness. Talking Book reading should supplement braille reading which, being an instrument of reading as well as of communication, will always retain its fundamental importance. As to the question of sacrificing spelling by the use of the Talking Book: Certainly, braille reading provides spelling, which is very important, but no pronunciation and diction; Talking Book reading gives no spelling, but pronunciation and diction, which are of no less importance.

The task of applying both reading media and weighing their importance in the educational process of the individual blind child is of course left to the teacher's pedagogic skill and judgment.

Music and Drama—A Social Unit

Barbara Ellen Bartlett

The need for desirable social situations in lieu of normal home and community environment for sightless boys and girls in a residential school, has been met at the Connecticut School for the Blind by a series of Social Units, a cooperative plan arranged by the teachers, and combining educational and social training through contacts with seeing children from local clubs and organizations. Each unit was to cover a period of three or four weeks, and feature a project designed to integrate the classwork of several departments on a similar grade level. Each instructor supervised his share of the activities under the general direction of the teacher in charge of the unit.

The teachers who were to have charge of each unit were chosen alphabetically, and since my work is with the younger boys and girls, I selected the opera, *Haensel and Gretel,* as the basis of the unit I would supervise. An opera permitted the fortunate combination of music and dramatics, in addition to many other valuable opportunities for primary children, such as spelling and pronunciation of new words, handicraft work in the construction of model sets and the costuming of characters, nature study, dancing, and the numerous social activities connected with the entertainment of seeing children from the community.

In order to make plain in what ways this unit was meant to have social value, I shall quote the aims:

Teacher's Aims

1. To acquire social intercourse through music appreciation and dramatization.
2. To acquire desirable attitudes such as courtesy, fairness, responsibility, and social poise.
3. To give children an understanding of and love for opera.
4. To give the child a rich experience by having him learn some of the music and by having him live the story through dramatization.

Pupils' Aims

1. To learn the real operatic version of *Haensel and Gretel.*
2. To learn something of the composer and how he happened to compose this particular opera.
3. To hear the story unfold through the music and the dialogue.
4. To live the story through the actual acting of it.
5. To enjoy the social side which rehearsals always present.
6. To learn how to entertain guests in a worth-while way.

In explaining the project to the children who were to participate, I outlined the purposes of the plan, both from the point of view of the pupils and of the teachers. Introducing the subject which had been selected, I asked the question, "How many of you know the story of Haensel and Gretel?"

The response indicated immediate interest on the part of the pupils. Several remembered reading the story in their health books; others had read it in a book of fairy tales, and all of them were eager to tell their own version. I then asked them if they knew that the story had been set to music. It appeared that they did not, and they were eager to hear more about this. Therefore, my next question was, "Does anyone know what is meant by an opera?"

There were but few responses to this, and these were rather vague, but the interest of the group had been aroused. There followed an informative discussion of the story—its origin as an old nursery rhyme, its development as a fairy tale, the modern versions presented in various books, the opera, interesting facts about the composer, Engelbert Humper-

dinck, and the circumstances surrounding the composition of this particular opera.

My next question, "Would you like to learn more about the opera and dramatize it?" met with unrestrained enthusiasm, so we immediately agreed to set aside the last period in the afternoon, four days a week, for three weeks, for this special purpose.

During the time allotted, we read several versions of the story and listened to the reading of the opera, playing phrases on the piano as we studied them. We discussed the scenes and the characters, decided on the roles the different pupils should play, and then dramatized the story, bit by bit, in elocution classes. The usual lessons in spelling and grammar were replaced by special assignments during which we studied the use of capital letters and marks of punctuation, and the spelling of such words as the following:

Haensel	cage	witch
dewman	music	oven
compose	Ilsenstein	opera
Peter	Gertrude	curtain
prayer	Engelbert	sandman
Gretel	Humperdinck	composer
author	interlude	gingerbread
create	forest	garland

We selected a date for the presentation of the results of the project, and then wrote a note to the junior choir of Immanuel Church, inviting ten boys and ten girls to attend a demonstration of our work, and to enjoy roller skating, skee-ball and bowling with our pupils. The superintendent replied that all of the choir members were so eager to accept the invitation that it was difficult to make a selection, so the choirmaster had agreed to reward the ten boys and ten girls who behaved the best. My nephew, who was a member of the choir, had visited our school several times, and had become familiar with our teaching methods. In preparation for the acceptance of the invitation, the superintendent asked him to tell the other choir members about the school, the reading of braille, and the curriculum.

After the completion of these arrangements, the children continued work on all phases of the project, with a view to having everything in readiness for the visit of their guests. During handicraft classes they modeled the characters in the opera. The partially-seeing pupils constructed a scene on the sand table. They cut out and colored the witch's house, oven and cage, some trees, the witch and the two children. Corrugated cardboard, placed upright around the back and sides of the sand table scene, represented the Ilsenstein Forest; the blind pupils painted this green, pasted trees on it, and colored in the sky at the top. The figures were arranged in the foreground to represent a scene in the opera. The partially-seeing pupils described and talked about everything they did so that the totally blind pupils could understand and enjoy the work.

Meanwhile, the junior chorus rehearsed the songs they were to sing, and all the pupils joined in learning the following selections from the opera:

The Children's Prayer
The Broomstick
Brother Dear, Come Dance With Me
A Little Man Was Standing Within a Wood
Dewman's Song
Ha– Ha– Ha–
Gretel's Song
Peter's Greeting
The Witch's Ride
Cuckoo
Sandman's Song
Nibble, Nibble Mousey
Hocus Pocus

On certain mornings, during chapel, we presented some part of the work; for example, a little girl told interesting facts about the opera and its composer; one of the boys played "Gretel's Song" on the piano; the senior chorus sang "The Children's Prayer"; and, toward the close of the project, we presented the entire dramatization in the form of a dress rehearsal. This gave the older pupils an opportunity to observe our work, and the members of the cast a chance to gain additional skill. Properties, including a basket, broom, jug, stick, and witch's hat were col-

lected by the pupils in charge, and the nature study class made a garland of leaves to be worn by Gretel.

The social aspect of the project was not neglected, and certain periods were set aside for group practice in receiving visitors, making introductions, joining in conversations, arranging games and serving refreshments.

On the afternoon designated for the presentation of the work, the pupils carried out the duties assigned them with a marked degree of responsibility. Certain boys, acting as guides, conducted the visitors around the buildings, pointing out everything of interest. The girls then explained the purpose of the project, and reviewed the work accomplished. Following this, the opera-drama was presented. After its conclusion, the guests were divided into four groups and participated in games with the blind children, until time for the serving of refreshments.

The faculty members considered the project highly successful from both an educational and a social point of view, and were extremely gratified by a letter received a few days later from the superintendent of the Sunday School, in which it was stated that the work of the blind pupils had been so impressive that the visiting children felt that they had derived even more value from the experience than the participating students.

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It is a peculiarity of almost every field of endeavor, and more especially of education, that each instructor considers his own field quite the most important of all to the growth of knowledge in the child. It is, therefore, natural that those of us who are concerning ourselves with tactual education should consider it an absolute essential in the education of the blind child. In the past, much of the education in this tactual field has been incidental and of secondary importance. It is true that many teachers have had a keen sense of the value of this subject and have developed it in their own individual way to the great benefit of the child, but just as the public consciousness is awakening to the educational value of art and science museums, so we dare to believe that educators of the blind are becoming more conscious of the need for a well-organized and conscious development of tactual education. The field is as yet but lightly scratched, but if the experiments conducted at Perkins Institution during the past two years help to give the subject the prominence it deserves, the committee engaged in this work will feel well repaid.

If any of the teachers in other schools are interested in receiving a sample copy of a bulletin on this subject or wish to ask special questions about the project, the writer would be very glad to give any help possible.

The Teachers Forum

for

Instructors of Blind Children

Address all communications to

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American Foundation for the Blind

15 West 16th Street

New York, New York

The Editor will not be responsible for opinions expressed in signed articles

NOVEMBER, 1941

Three important publications have been released recently by the Foundation.

1. *Contributions to a Psychology of Blindness,* by Samuel P. Hayes, Ph.D., 296 pp.
2. *What of the Blind? A Survey of the Development and Scope of Present-Day Work with the Blind, Vol. II,* edited by Helga Lende, 206 pp.
3. *Teachers of the Blind; Their Status and Salaries,* by Berthold Lowenfeld, Ph.D., 44 pp.

Dr. Hayes' book presents the most important studies of this leader in the field of mental measurement of the blind. The studies have appeared in our professional magazines

and are now made available in book form after a thorough revision.

Miss Helga Lende, Librarian of the Foundation, has collected in *What of the Blind? Vol. II,* seventeen articles written by experts in various fields of work with the blind. The articles have been organized under the following headings: Interpretation of Blindness; Special Educational Problems; Personal Adjustment of the Adult Blind; Economic and Vocational Adjustment; Statistics of Blindness; The Federal Government and the Blind.

Dr. Lowenfeld's study reports and interprets the results of a comprehensive survey based on questionnaires. The chapters of the study are: The Status of Teachers in Residential Schools for the Blind, (A) Personal Status, (B) Professional Status; Salaries of Teachers in Residential Schools for the Blind; Comparison of Teachers' Salaries in Residential Schools for the Blind and in Public Schools; Summary of Facts.

On a recent trip to the northwest to conduct surveys of the Utah and North Dakota schools we were also able to visit the schools in Colorado, Idaho, Oregon, Washington, Montana and Iowa. It was gratifying to note new building operations in Colorado, Idaho and Iowa and to learn that additional construction is being arranged for in Oregon.

The most important problem in all of the schools visited seems to be to make proper provision for the sight-saving pupils which make up a gradually increasing percentage of the school population. Providing for these pupils and for retarded ones is more difficult in small schools, and in states containing few large cities there are many such pupils who should not be in regular public school classes and cannot be economically provided for in special classes in the public schools.

Glowing reports were received regarding the courses in Dramatics and Play Production given last spring in Oregon and Washington by a professional New York coach employed by the Foundation. The addition of considerable new industrial work for the blind as well as the deaf students is contemplated at the Utah school. We shall be interested to see which of the new industries prove most practical. On the whole, the recent trip was one of the most interesting and enlightening of those which have taken us to all of the schools for the blind in the United States except two.

We should greatly appreciate the receipt of any copies of the March, 1941 issue of the THE TEACHERS FORUM which our readers do not care to keep.

All teachers of exceptional children should read the June, 1941 issue of the *Review of Educational Research.* This entire issue is devoted to "Education of Exceptional Children and Minority Groups." Copies may be ordered from the American Educational Research Association, 1201 Sixteenth Street, N.W., Washington, D. C.

Our Contributors

Dr. B. F. Holland, who has contributed a number of interesting articles to THE TEACHERS FORUM, is an instructor in the department of educational psychology of the University of Texas.

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Barbara Ellen Bartlett teaches the third and fourth grade classes and directs the girls' physical education work at the Connecticut School for the Blind.

The other contributors to this issue of the FORUM send us articles so regularly that they need no introduction to our readers.

The Teachers Forum

FOR

INSTRUCTORS OF BLIND CHILDREN

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Volumes One—Ten
1928-1938

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COMPILER'S NOTE

Names of authors are set in capitals.
Subjects are set in roman type.
Names of articles and poems are set in roman type with quotation marks.
Names of books, pamphlets, and periodicals are set in italics.

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